ENVIRONMENTAL STATEMENT

VOLUME 2

LAND AT HARTNOLLS FARM, TIVERTON

PREPARED FOR WADDETON PARK LIMITED

OCTOBER 2022

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1.0 Introduction

1.1 Overview

EIA Process

1.1.1 The Planning Practice Guidance (PPG) provides guidance on EIA procedures and the preparation of ES.

Screening and Scoping

1.1.2 Prior to the preparation of this ES the applicant sought an EIA Screening/Scoping both an EIA Screening Matrix and Scoping Opinion has been provided by Mid Devon District Council (dated 15th October 2021) under Regulation 15 of the EIA Regulations.

1.1.3 A copy of both the Screening Matrix and Scoping Opinion is provided at Volume 3, Technical Appendix 1.1

1.1.4 In preparing this ES reference has been made to the PPG and in particular section 6 'Preparing an Environmental Statement' where it states that:

> *"The opinion should be proportionate, tailored to the specific characteristics of the development and the main environmental features likely to be significantly affected."* Paragraph: 036 Reference ID: 4-036-20170728
>
> and;
>
> *"Requests for further information should be limited to the "main" or "significant" environmental effects to which a development is likely to give rise and must be on relevant matters and directly relevant to reaching a reasoned conclusion on the significant effects of the proposed development on the environment (regulation 26)."* Paragraph: 047 Reference ID: 4-047-20170728

1.1.5 The discrepancy of scope between the applicant's assessment of scope, and that of the LPA, should be noted. The applicant has sought to respond, as best as

they are able, to the opinion of the LPA but, due to the restricted scope of the application (i.e. its' outline nature) it's simply not possible to provide a fulsome assessment across the full scope of environmental components sought by the LPA. We consider the Council's opinion on scope to not accord with section 6 of the NPPG.

Format

1.1.6 This ES comprises three volumes. This document (Volume 2) provides the main body of the ES. It explains the baseline conditions for the application site, the method statement for the assessment, and the findings of the assessment. It should be read in conjunction with the accompanying Technical Appendices that are set out in Volume 3.

1.1.7 The EIA Regulations also require a Non-Technical Summary (NTS) of the ES. The NTS forms Volume 1 of this ES. It explains in brief the main components and findings of the ES for the benefit of those unfamiliar with the EIA process.

1.1.8 Copies of the ES can be seen at:

Mid Devon District Council
Phoenix House
Phoenix Lane
Tiverton
Devon EX16 6PP

1.1.9 Copies in CD format can also be purchased for £40 each from:

PCL Planning Ltd
13a – 15a Old Park Avenue
Pinhoe, Exeter
Devon EX1 3WD

1.2 Site Location and Description

1.2.1 The site is located approximately 1.2km to the east of Tiverton and approximately 1.0km to the west of Halberton.

1.2.2 The site comprises approximately 12.36ha of pastoral land that wraps around the existing Hartnoll Business Centre (HBC), and is bordered by Post Hill to the north and Manley Lane to the west. A copy of the site location plan is provided at Technical Appendix 1.2.

1.2.3 The site consists of a number of irregular large pastoral fields with generally well-defined hedgerow boundaries including occasional hedgerow trees. At the lowest point of the site, along the southern edge, is the Ailsa Brook, which forms a defensible boundary to the site before further open agricultural land to the south rising up to the Country Park of the Grand Western Canal.

1.2.4 The site abuts the eastern boundary of the Tiverton Eastern Urban Extension (EUE) area.

1.2.5 Some 250 metres to the east of the site is an anaerobic digestion (AD) plant within the same ownership as HBC.

1.2.6 The site is not subject to any international or national designations. The site is located in proximity to the Tidcombe Fen SSSI.

1.2.7 The site is predominantly located within flood zone 1, aside from a very small area towards the southwest corner of the site which is within flood zone 2, associated with Ailsa Brook.

1.2.8 Tiverton is the largest settlement in Mid Devon District (with a population of approximately 38,000) providing a broad range of services, facilities and employment. Halberton is a sizeable village (with a population of approximately 900) with a primary school, local shop, farm shop and public houses.

1.2.9 Specifically, the following services and facilities are provided within 5 km of the site:

- Hospital;
- Schools;
- Supermarkets;
- Doctors Surgeries;
- Pharmacies;
- Dentists;
- Opticians;
- Library;
- Fire Station;
- Police Station;
- Recreation Grounds/Parks; and
- A large number of local shops and public houses.

1.2.10 The A361, which is easily accessible from the site, is an important road on the strategic highway network providing access to North Devon, the M5 and beyond. The closest bus stops to the site are located along Post Hill, approximately 200m west of the existing Hartnoll Business Centre access. In terms of rail connections, Tiverton Parkway station is located approximately 6.5km east of the site. Tiverton Parkway Station is served by half hourly services to London Paddington via Taunton and Reading, and to Penzance via Exeter St Davids. The journey time to Exeter is approximately 15 minutes. The station is also served by hourly services to Bristol Temple Meads, Cardiff and Birmingham to name a few.

1.3 Methodology and Assessment Criteria

1.3.1 In relation to cumulative effects, specifically this ES contains an assessment of two types of effect:

1. The combination of individual effects (e.g. noise, dust, traffic, visual) from the development on a particular receptor; and

2. Effects from several developments, which individually might be insignificant, but when considered together would create a significant cumulative effect

1.3.2 The first type of cumulative effects are dealt with in Chapter 16 of this ES. In terms of second type of effects these are dealt with in each of the technical chapters (Chapters 3 to 14).

1.3.3 The schemes included (unless specifically stated otherwise in a technical chapter) for the assessment of cumulative effects are identified in the Table 1.1.

Table 1.1 – Cumulative Schemes

Scheme	Status	General description of scheme	Additional information
Tiverton Eastern Urban Extension ('Tiverton EUE')	Mid Devon Local Plan (2013-2030, adopted July 2020), Policies TIV1 - TIV5 allocate 153ha of land east of Tiverton for mixed-use development. Approved Tiverton EUE Masterplan SPD (originally adopted April 2014, updated in June 2018) to guide development of area. Outline planning permission has been granted for up to 1,030 dwellings, with subsequent reserved matters approval for 498 dwellings. Full planning permission has also been granted for 30 dwellings and a care home.	• Up to 1,830 dwellings • Up to 30,000 sqm commercial floorspace • 5 pitches for gypsies and travellers • Community facilities including a new primary school and neighbourhood centre • Care home • Green infrastructure – multi-functional parkland comprising of community orchards and allotments, informal open space, children's play areas, habitat areas and attenuation ponds	The following applications relate to the EUE area: *Land off Uplowman Road – Outline application (13/01616/MOUT)* "Outline for the development of up to 330 dwellings together with public open space, associated infrastructure and other works including vehicular access, pedestrian/cycle links and highway improvements." (approved 18th September 2015) *Reserved matters application (18/00133/MARM)* for 248 dwellings, 3 gypsy and traveller pitches, public open space, landscaping, pedestrian/ cycle and vehicular links and associated infrastructure (approved 29th August 2018) *Reserved matters application (21/00128/MFUL)* for 86 dwellings, public open space, landscaping, pedestrian, cycle and vehicular links and associated infrastructure (approved 11th November 2021) *Land south of A361 and adjacent to Blundells Road* *Outline application (14/00881/MOUT)* "Outline for a mixed use development comprising up to 700 dwellings, 22,000 square metres of B1/B8 employment land, care home, primary school and neighbourhood centre with associated access including a left in left out junction on the westbound A361 and access and egress onto Blundells Road." (approved 12th June 2017) *Reserved matters application (21/00374/MARM)* in respect of infrastructure associated with initial phases of development (approved 30th June 2021) *Reserved matters application (21/00454/MARM*) for 164 dwellings, open space and landscaping (awaiting decision) *Reserved matters application (21/02014)* in respect of the area associated with the attenuation pond, drainage infrastructure and related details (awaiting decision) *Land at Post Hill Nursing Home* *Full application (14/00604/MFUL)* "Erection of care home and 12 apartments with associated access, parking and landscaping, following demolition of existing hospital buildings (Revised Scheme)" (approved 20th April 2017) *36 Post Hill Tiverton* *Full application (19/00210/MFUL)* "Demolition of buildings and erection of 18 dwellings and associated works, including vehicular access, garages, parking and landscaping) – 20/01760/NMA (approved 13th November 2020)

New road junction onto the A361	Full planning permission (14/01168/MFUL, approved 31st October 2014) Full planning permission (14/00667/MFUL, approved 4th September 2014)	"Construction of a 'cloverleaf' road junction with access and egress onto both the eastbound and westbound carriageways of the A361 with associated engineering works, drainage facilities, embankments, road bridge, lighting, soft landscaping and a noise barrier to the rear of the houses on Uplowman Road, a roundabout, a stretch of connecting highway and a junction and access onto Blundell's Road with associated engineering works and landscaping" "Construction of a 'left in left out' road junction with associated engineering works, drainage facilities, embankment, soft landscaping and noise barrier"	Full planning permission has been granted for the new road junction and this has been implemented.
TIV13 Tidcombe Hall	The site is identified in the Local Plan as a 'contingency' site. Outline planning permission (ref. 20/01174/MOUT) refused in June 2021 for up to 179 dwellings, including the conversion of Tidcombe Hall and outbuildings to dwellings, shop, café, open-sided shelter, allotments, community orchards and public open space.	Local Plan policy TIV13 allocates the site as a contingency for residential development of 100 dwellings.	-
TIV16 Blundell's School	The site is allocated in the adopted Local Plan. There do not yet appear to have been any applications made for the residential development of this site.	Local Plan policy TIV16 allocates the site for 200 dwellings.	-

1.4 Key Issues

Issues for Assessment

1.4.1 This section identifies the key environmental issues that are assessed within this ES with regard to the site and the proposed development.

1.4.2 Following initial baseline work to inform the preparation of the scheme and the scoping undertaken by the applicant, the key issues identified and assessed within this ES include:

- Socio economic;

- Arboricultural;
- Ecology and biodiversity;
- Archaeology and cultural heritage;
- Transport and accessibility;
- Flood risk and drainage;
- Air quality and dust;
- Ground conditions, contamination and land quality;
- Landscape and visual;
- Noise and vibration;
- Waste management;
- Utilities.

1.4.3 Cumulative effects related to all of the above key issues are dealt with within each technical chapter as well as within a standalone chapter (Chapter 15), where further consideration is given any impacts arising from a combination of individual effects on a single receptor.

1.5 Proposed Development and Construction

Proposed Development

1.5.1 The proposed development is an outline application, with all matters except means of access reserved for future consideration. The description of development is as follows:

> *Phased outline application for the extension to the existing business park for up to 3.9ha of employment land and up to 150 residential dwellings with associated open space and infrastructure (with means of access to be determined only).*

1.5.2 The Illustrative Framework Plan (together with other documentation submitted as part of this outline application) shows how this mixed use development can be delivered in an acceptable manner at the site. A copy of the Illustrative Framework Plan is provided at Technical Appendix 1.3. The proposal shown on the plan has been designed through a thorough understanding of the site (characteristics and features) and was informed by the findings of a range of

baseline work. The proposals have therefore been designed to sure that any adverse impacts are avoided or minimised.

1.5.2 In terms of the proposed land uses and quantity of development, the following is proposed:

- Up to 3.9ha of employment use (Use Class E)
- Up to 150 residential dwellings (Use Class C3)
- Public open space (including informal amenity space, children's play)

Construction

1.5.3 At this stage, it is not possible to detail exactly how the proposed development will be constructed. This will become clearer once the detailed design of the proposed development is defined (at the reserved matters stage). This section therefore provides an indication of the anticipated construction phases, the general works/activities involved, and assumptions made to assist in identifying and assessing the potential construction impacts.

Enabling works

1.5.4 Prior to the start of construction there will be a need to undertake a range of enabling work, which is likely to include:

- Additional survey work related to utilities and the undertaking of any necessary works;
- Construction of site access and internal spine roads;
- General site preparation ready for foundation work, inclusive of ground works that will be necessary to facilitate the delivery of the scheme;
- Investigations and surveys necessary to define ground conditions in advance of construction of foundations and structures; and
- Further archaeological investigations where required.

Construction Machinery/Plant

1.5.5 Whilst the exact detail of construction machinery/plant is not known at present consideration has been given to the types of machinery that are likely to be used. The following are considered to be the key types of machinery/plant to be used:

- Excavators (tracked/wheeled)
- Dumpers
- Power tools including percussion drills, cutting disks, pipe-threaders
- Hand held tools including breakers (pneumatic and hydraulic)
- Ready mix concrete lorries
- Delivery trucks - Heavy duty vehicles and light duty vehicles
- Air compressors
- Fork lift trucks
- Wheel washing plant
- Road sweepers
- Mobile/tower cranes
- Skips and skip trucks
- Road surfacing machinery/vehicles

Construction Operations and Traffic

1.5.6 Impact from construction operations and traffic is temporary and will have a relatively short-term effect on some existing roads within the local highway network.

1.5.7 The potential impacts which could arise from the activities on construction sites are due to the following:

- demolition (removal of existing structures);
- earthworks (soil-stripping, ground-levelling, excavation and landscaping);
- construction (activities involved in the provision of a new structure); and
- track out (the transport of dust and dirt from the construction site onto the public road network where it may be deposited and then re-suspended by vehicles using the network).

1.5.8 As the project is at outline stage is not possible to be exact about the level and programming of construction traffic. Construction traffic volumes have therefore been estimated for this assessment based on similar developments elsewhere.

1.5.9 The design of infrastructure whether possible/practical will minimise earthworks so it is not expected that there would be substantial quantities of soil to be removed from the site. In this regard, the detail of the levels of cut and fill can be considered in more detail at the appropriate stage.

1.5.10 Traffic routes used by construction vehicles when delivering goods and material to and from the site will be agreed with Mid Devon District Council and other relevant authorities, such as Devon County Council Highways, prior to construction activity commencing (expected as part of a Construction Environmental Management Plan).

1.5.11 Working hours will be agreed with the Local Planning Authority and are expected to be 08.00-18.00 weekdays and 08.00-13.00 on Saturdays. It is however expected that the majority of deliveries would be scheduled to occur outside the peak traffic periods on the highway network.

Controls to protect the local environment and receptors

1.5.12 It is important to ensure there are controls in place to protect the local environment and provide mitigation for identified construction impacts. It is anticipated that these control measures, which are either proposed as mitigation or assessed as embedded within technical chapters, will be secured by appropriate planning condition.

1.5.13 The preparation of a Construction Environmental Management Plan (CEMP) is an established method of managing environmental impacts resulting from construction works. The CEMP would be submitted and agreed in advance of commencement of works. The obligations of the CEMP would be passed on to the

contractors as 'employer requirements' within the contract for the works. The structure of the CEMP is expected to include:

- A table (logical framework) showing the objectives, expected results, activities (mitigation/optimisation measures), and responsibilities for the implementation of those activities;
- The broad plan of the phasing of the work and its context within the whole project;
- Inclusion of baseline levels for noise, vibration and dust and monitoring protocols;
- Setting of 'threshold' and 'action levels' for noise, vibration and dust to warn of activities that may require particular care and control;
- Details of prohibited or restricted operations (location, hours etc.);
- Institutional arrangements for its implementation and for environmental monitoring: responsibilities, role of the environmental authorities, participation of stakeholders;
- Suggestions for contracts (environmental clauses and standards) and contracting modalities;
- A monitoring and supervision plan (including appropriate indicators, frequency of monitoring, means to gather and analyse the data, reporting system);
- A response plan in case of accidents or unexpected results from the environmental monitoring;
- Reference to ground conditions and remedial measures and/or mitigation associated with ground contamination if necessary;
- Contact during normal working hours and emergency details outside working hours;
- Provision for reporting, public liaison, and prior notification of particular construction related activities;
- The mechanism for the public to register complaints and the procedures for responding to such complaints;
- The details of proposed routes for heavy goods vehicles travelling to and from the site; and
- Reference to management of material resources and waste.

2 Consideration of Alternatives and Scheme Evolution

2.1 Consideration of Alternatives

2.1.1 The EIA Regulations require an outline of the main alternatives studied and an indication of the main reasons for selecting the proposed option, taking into account the environmental impacts, to be included in the ES.

2.1.2 The proposed development is to expand the current business park, predominantly in a southerly direction, and to meet the energy needs of the whole park (including migration of the existing business park) via a low carbon supply. The investment in low carbon future needs would be enabled by an element of residential infill between the business park and the current edge of the allocated Tiverton eastern extension.

2.1.3 The proposal will provide a supply of employment land to help meet demand which is not otherwise being catered for in the locality.

2.1.4 The proposal seeks to create a business hub building that includes flexible office space suitable for co-working with provision of public and private meeting spaces, tele-conferencing suites.

2.1.5 A key component to the success of the enlarged park will be flexibility. In particular, modular units will facilitate this. Landscaping, open break-out space and parking will be key ingredients to creating a good working environment.

2.1.6 Before the current development was advanced to the application stage, consideration was given to an alternative mix of uses at the site (including greater areas for both employment and residential development, a local centre, primary school and public open space) across a larger area of land, and was promoted for development to the Council through the Local Plan process.

2.1.7 After further analysis, the decision was taken to omit part of the land to the south and east of the existing business park and to move towards the scheme now

proposed, which relates to land situated between the existing business park and allocated land forming the Tiverton Urban Extension (TUE).

2.1.8 The applicants have undertaken a range of further technical and specialist studies to inform the preparation of more detailed proposals for the site. This process has allowed the environmental constraints and opportunities at the site to be understood. The outcome of this next stage in the evolution of the proposals has been the preparation of an illustrative masterplan.

3 Socio-Economic Effects

3.1 Introduction

3.1.1 This chapter assesses the likely significant direct and indirect impacts of the development on the local and district community and economy.

3.2 Assessment

3.2.1 Employment will be created during the construction and operational phases of the development.

3.2.2 The proposal will create significant new jobs during the construction phase of the project. This will increase turnover and profit for local businesses.

3.2.3 The proposal will contribute towards low carbon/climate change objectives via the use of AD plant to generate electricity and provide surplus heat to the proposed business park.

3.2.4 As the submitted employment report clearly demonstrates Tiverton has been starved of an significant supply of new employment floorspace for a considerable period of time. This has led to businesses leaving the settlement in order to secure suitable expansion space. This situation was exacerbated following the recent fire at Tiverton Business Park (that occurred on 02/02/22) resulted in a spike in enquiries about new space at Hartnoll Business Park.

3.2.5 We therefore conclude that the employment element of the proposal will deliver significant socio-economic benefits.

3.2.6 The proposed housing will cross-subsidise the delivery of the new employment land, and it's sustainable power source (the linkage to the existing anaerobic digester). The is an evidential need for new affordable housing provision at Tiverton. The proposal will deliver new housing to meet this need.

3.2.7 The adopted DP makes limited provision for new housing at Tiverton and places a heavy reliance on delivery at Cullompton, much of which cannot be delivered until significant new infrastructure is in place. There is therefore considerable doubt whether new housing will be delivered at Cullompton in a timely manner or not. Bearing both these factors in mind, and having regard to the pressing need for new employment floorspace at Tiverton, the delivery of this mixed use proposal will provide an opportunity for a balanced and sustainable delivery of both new jobs and homes.

3.2.8 We therefore conclude that there will be significant socio-economic benefits that will occur if the proposal is delivered.

4 Arboricultural Impacts

4.1 Introduction

4.1.1 The application is made in outline, with details of landscaping reserved for future determination. Having regard to the restricted scope of this proposal it is simply not possible to be entirely specific about the impact of the proposal.

4.1.2 The illustrative layout provided to support the application demonstrates that there will be significant areas of new planting that will increase tree cover, to a significant extent, over and above existing baseline conditions.

4.1.3 The areas proposed for development are currently in agricultural use and there are no significant trees located within the fields themselves. The only trees of note are located within the hedgerows and they are, in the main, proposed to be maintained. Therefore the impact of the proposal on baseline conditions will be negligible.

4.1.4 It is clear that subject to the imposition of suitable conditions there will be a net gain in arboricultural conditions at the site.

5 Ecology and Biodiversity

5.1 Introduction

5.1.1 Engain was commissioned by Waddeton Park Ltd to carry out an ecological survey of a proposed development site known as Hartnoll's Farm near Tiverton in Devon. Engain has surveyed this site extensively in the past, and the purpose of this latest survey was to verify the key findings of previous surveys and undertake targeted protected species surveys in the context of a new development plan which covers a much smaller area than has previously been considered. Appendix 1 shows the new survey area in the context of the area previously surveyed by Engain.

5.1.2 The scope of the appraisal was based on the Guidelines for Preliminary Ecological Appraisal, published in 2012 by the Chartered Institute of Ecology and Environmental Management (CIEEM). This included a desk study to identify any notable or protected sites, habitats or species on or near to the site, a field survey to map and describe the habitats of the site, and an assessment of the site's potential to support any notable or protected species.

5.1.3 The purpose of this report is to:

a) Describe the ecological baseline of the site and assess the importance of its ecological features (*e.g.* its habitats and species);
b) Determine if any further, more detailed surveys are required;
c) Identify any ecological constraints to the development proposal and describe how negative ecological effects will be avoided;
d) Describe appropriate measures to mitigate negative ecological effects that cannot be avoided; and
e) Describe how opportunities for ecological enhancement will be integrated into the proposal.

5.1.4 Further details of the survey and assessment methods are given in Section 4.

5.2 Site Location and General Description

Site Location

5.2.1 The site is located to the east of Tiverton, Devon approximately 2km to the east of the town centre. The Ordnance Survey grid reference for the centre of the site is SS 983 128.

General Description

5.2.2 The site is bounded to the north by Post Hill and an unnamed road to the west. Agricultural buildings at Hartnoll's Farm and a mature hedgerow form the southern boundary of the site. Hartnoll's Business Park is located in the north western area of the site this area is not included within the survey area. There are three neighbouring residential properties at the north western boundary area of the site.

5.2.3 In a broader context the site area is well connected to the wider landscape by the nearby Grand Western Canal, hedgerows, woodland and tributaries of the River Lowman to the west. The wider landscape consists of arable and cattle grazed farmland.

5.3 Legislation and Policy

Introduction

5.3.1 Wildlife in the UK is protected through European Directives, which are transposed into national legislation, supported by a range of national and local policy and guidance. Recent changes in planning policy and legislation have gone beyond site and species-specific protection to set broader goals for the conservation and enhancement of the natural environment and halting the continued loss of biodiversity in the UK.

5.3.2 Development can contribute to these goals through, for example, protecting the best features of a site and making them a valued part of the site's new use, and by incorporating enhancements to improve the site's value for wildlife.

5.3.3 The sections below provide a brief guide to the principal legislation and policy that sets the terms of reference for ecological appraisals in the UK. This is not intended to be a full description of all the obligations enacted by the various referenced documents, which should be referred to in their original form for the full details.

5.3.4 It is the responsibility of those involved with the development works to ensure that wildlife protection and nature conservation legislation is complied with at every stage of the project. Such legislation applies even in the absence of related planning conditions.

Relevant Legislation

5.3.5 The principal pieces of legislation relating to wildlife that are of relevance to this report are:

1. *EU Habitats Directive (1992);*
2. *EU Birds Directive (1979);*
3. *Conservation of Habitats and Species (Amendment) Regulations 2017;*
4. *The Wildlife and Countryside Act 1981 (as amended);*
5. *The Countryside and Rights of Way Act 2000;*
6. *The Natural Environment and Rural Communities Act 2006;*
7. *The Protection of Badgers Act 1992* (which is extended under *The Hunting Act 2004*).

5.3.6 The main focus of much of this legislation is the protection of sites and species, the delineation of precisely how they are protected, and what actions would constitute an offence. This report provides guidance on whether any protected features are likely to be affected by the development proposal, and how offences under the legislation can be avoided.

Relevant Policy

5.3.7 Regional and local planning authorities are obliged to follow key principles to ensure that the potential impacts of planning decisions on biodiversity conservation are fully considered. *The National Planning Policy Framework* sets

out the Government's policies for the protection and enhancement of biodiversity through the town and country planning system. This encourages the contribution to, and enhancement of, natural and local environments through minimising the impacts on biodiversity and providing net gains in biodiversity where possible.

5.3.8 Planning authorities are required to follow key principles in their consideration of potential impacts of planning decisions on biodiversity conservation. *Circular 06/05: Biodiversity and Geological Conservation* provides guidance on the application of the law relating to planning and nature conservation and complements the *National Planning Policy Framework.*

5.3.9 The presence of species protected under UK and European legislation are a material consideration when a planning authority is considering a development proposal that, if carried out, would be likely to result in harm to the species or its habitat. Ecological appraisals and protected species surveys are therefore designed to provide local planning authorities with the baseline information they require in order fully consider the potential ecological effects of a planning application.

5.3.10 Biodiversity *2020: A strategy for England's wildlife and ecosystem services*, provides the *UK Biodiversity Action Plan* and country level biodiversity strategies for England, based on the list of habitats and species listed under *The Natural Environment and Rural Communities Act 2006*.

5.3.11 Local biodiversity action plans give valuable information on local conservation priorities. The *Devon Biodiversity Action Plan* is the local biodiversity action plan relevant to this site.

5.3.12 The site is within the District of Mid Devon, and the Mid Devon Local Plan therefore sets the relevant local planning policies. The Local Plan Part 3 contains the Development Management Policies, of which the following are of particular relevance to this site:

- DM28: Green infrastructure in major development; and
- DM30: Other protected sites.

5.4 Methodology

Desk Study

5.4.1 Data was provided by Devon Biodiversity Records Centre (DBRC) in June 2018 in order to update the data previously analysed during the original surveys and assessments. The search area was set at a radius of 2 km from the site boundary for protected and notable species (extended to 4 km for bats and for designated sites).

5.4.2 Online resources were also used, including the UK government's online resource for geographic information about the natural environment (MAGIC Map).

Extended Phase 1 Habitat Survey

5.4.3 A site verification survey was conducted on 21st April 2020. The field survey methods were based on the Phase 1 Habitat Survey methodology (Joint Nature Conservancy Council, 2010). The main habitat types were mapped using standard habitat colours. The additional (extended) aspect of the survey method involves the identification of habitats that may support notable species and searching for evidence of such species.

5.4.4 Target notes (see Appendix 2: Habitat Plan) are used to indicate points of ecological interest and they are referred to in this report.

5.4.5 Considering the site location, context and the habitats it contains, the following protected species are considered in this report:

- badgers (*Meles meles*);
- bats;
- breeding birds;
- dormice (*Muscardinus avellanarius*); and
- reptiles.

5.4.6 Historic protected species surveys across a larger area by Engain have found that great crested newt (*Triturus cristatus*), otter (*Lutra lutra*), and water vole (*Arvicola amphibius*) are not present onsite. These species are not considered further in this report.

5.4.7 The site was also searched for non-native, invasive plant species, with particular care to search for the most commonly occurring and problematic species i.e. *Fallopia japonica* (Japanese Knotweed), *Impatiens grandiflora* (Indian Balsam) and *Heracleum mantegazianum* (Giant Hogweed).

Ground Level Tree Assessment

5.4.8 A Ground Level Tree Assessment was (GLTA) was conducted on 25th May 2018 by an experienced ecologist. The methodology of the assessment followed the relevant guidelines (Collins, 2016 and Mitchell-Jones & McLeish, 2004).

5.4.9 External inspection of the trees on site took place during daylight hours, with evidence of previous usage and current suitability for bats being searched for. Inspections involved searching for features that could be used by bats (e.g. cavities, crevices, loose bark, woodpecker holes, limb loss and niches) and for evidence of bats including urine or oil stains, feeding signs (e.g. moth wings, etc.), droppings, social calls or direct observations of bats.

5.4.10 Trees are separated into four categories. Category 3 trees have no potential to support bats. Category 2 trees have one or more feature, which may have potential to support individual bats. Alternatively Category 2 trees may have no obvious potential, but be of a size and age, with limited visibility to the crown, so that elevated surveys may be required. Category 1 trees have definite roosting potential, supporting one feature with potential for a larger roost. They may also have features with potential for individual roosts. Category 1* trees have more than one highly suitable feature capable of supporting larger roosts.

Assessment of Ecological Value

5.4.11 The habitats and species of principal importance for biodiversity in England are listed on *Section 41* of *The Natural Environment and Rural Communities Act 2006*. In Scotland they are listed on The Scottish Biodiversity List.

5.4.12 The assessment of the relative nature conservation value of the features at this site is also assessed against published criteria wherever possible. The value of habitats in the UK is covered in a wide variety of literature, including Usher (1986) and Ratcliffe (1977).

5.4.13 The main criteria against which the value of habitats is assessed are rarity, diversity, naturalness and extent. High importance is also attached to habitats that have not been subject to agricultural intensification, and which often depend on traditional forms of management, such as ancient semi-natural woodland, species-rich meadows and traditionally managed grasslands and moorlands.

Previous Protected Species Surveys

5.4.14 The table below lists the historic surveys that Engain have undertaken at this site. The majority of these surveys covered a much larger area than that which is under consideration now.

Table 5-1. Record of Previous Surveys

Survey / Evaluation	Methods	Date(s)
Ecological Appraisal	Phase 1 Habitat Survey, assessment for protected species	July 2012 and May 2018
Great Crested Newt Surveys	Presence / Absence surveys following NE and Froglife guidelines	May – June 2012
Desktop Data	Data request from BBRC	April 2013
Dormouse Survey	Presence /absence surveys using 150 nest tubes spaced at 20m intervals	April – November 2013
Hedgerow Survey	Surveys to determine 'importance of hedgerows as defined in *The Hedgerow Regulations 1997*	May 2013
Bat Transect Surveys	Three surveyors walking transects across the whole site. Six dusk transects and one dawn transect. Following BCT Guidelines (2nd Edn)	June – October 2013

Static Detector Bat Surveys	Three Anabat SD2 recorders left for 5-7 nights on seven occasions	June – October 2013
Badger Survey	Following Mammal Society guidelines	May and July 2013
Reptile Surveys	150 reptile mats set out in suitable habitat and checked seven times	June – September 2013
Breeding Bird Surveys	Territory mapping following BTO's CBC techniques	April, May and June 2013
Verification of Ecological Appraisal	Phase 1 Habitat Survey, assessment for protected species	September 2013
Otter and Water Vole Surveys	Following NRA guidelines	September 2013
Ground Level Tree Assessment for Bats	Following BCT Guidelines (2nd Edn)	March 2014 and May 2018

Badger Survey 2020

5.4.15 During the verification site visit conducted on 21st of April 2020 a systematic search for evidence of badgers using the site was undertaken. Evidence includes features such as snuffle holes, latrines, setts or prominent mammal runs.

Bat Activity Surveys 2020

5.4.16 Bat activity surveys were carried out on 29th of April 2020, 26th May 2020 and 9th June 2020. The methods were in accordance with standard guidance (Collins 2016; Mitchell-Jones, 2004; and Mitchell-Jones & McLeish, 2004).

5.4.17 One transect route was surveyed during each activity survey, this is shown within the Bat Activity Transect Plan appended to this report at Appendix 3. The transect survey route was designed to cover the total footprint of the site and incorporated specific features of interest at listening stops. The transect route was walked by a single surveyor in alternate directions during each survey.

5.4.18 The aim of these surveys was to ascertain if any specific areas at the site were used by bats for foraging or commuting.

5.4.19 Details of the surveys are provided within the table below.

Table 5-2. 2020 Bat Transect Surveys

Date	Time	Start Temp (°C)	End Temp (°C)	Weather Conditions
29.04.2020	20:29 – 22:59	12	10	Wind: 4, Rain: 2, Cloud: 7
26.05.20	21:11 – 23:00	15	12	Wind: 0, Rain: 0, Cloud: 1
09.06.20	21:23 – 23:53	14	13	Wind: 1, Rain: 0, Cloud: 6

Static Detector Bat Surveys 2020

5.4.20 Static detectors (Anabat Express) were installed at two locations around the site over three separate periods in 2020 between 30th April to 5th May, 21st to 26th May and 9th to 15th June. Appendix 4 details the locations of the static detectors.

5.4.21 The aim of these surveys was to ascertain if any specific areas of the site were used by bats for foraging or commuting.

Reptile Surveys 2020

5.4.22 Reptile surveys were carried out in accordance with standard guidance and methodologies outlined in the Herpetofauna Worker's Manual (Gent & Gibson, 2003) and Froglife Advice Sheet 10 (Froglife, 1999).

5.4.23 A total of 75 reptile mats (sections of roofing felt approximately 1m x 0.5m) were distributed throughout the site on the 30th of April 2020. See the Reptile Matt Location Plan at Appendix 5 for reference, mats were position in suitable reptile habitat along the site margins.

5.4.24 They were left to bed in before being checked seven times, details of each survey visit are provided in the table below.

Table 5-3. Reptile Surveys

Date	Time	Air Temp (C)	Weather Conditions
05.05.2020	09:00 – 11:00	10-12	Wind: 2, Rain: 3, Cloud: 8
06.05.20	08:30 – 09:45	10-12	Wind: 1, Rain: 0, Cloud: 0
08.05.20	08:20 – 10:00	10-14	Wind: 1, Rain: 0, Cloud: 2
12.05.20	16:00 - 17:00	12-14	Wind: 1, Rain: 0, Cloud: 1
14.05.20	08:30 – 09:30	8-10	Wind: 1, Rain: 0, Cloud: 2
19.05.20	08:45 – 09:40	6-8	Wind: 1, Rain: 0, Cloud: 7
21.05.20	12:40 – 14:10	19 – 20	Wind: 1, Rain: 0, Cloud: 1

Limitations

5.4.25 Engain cannot verify the accuracy of third party information.

5.4.26 Extended Phase 1 Habitat Surveys are not definitive and represent a snapshot of the ecological status of a site. Data records help to provide a historical context, however the absence of evidence of a species does not prove that it does not use the site.

5.4.27 The previous surveys were conducted between 6 and 8 years ago. The implications that this has for the validity of conclusions made about various potential receptors is discussed in the following sections.

5.5 Results

Desk Study

Statutory Designated Site Records

5.5.1 There are three statutory designated sites within 4km of the site:

- Tidcome Lane Fen is a Site of Special Scientific Interest (SSSI) is located approximately 980m to the west of the site and is designated for its unimproved marshy grassland.
- The Grand Western Canal Country Park is a Local Nature Reserve (LNR) that is located along at its closest point approx. 260m to the east of the site. It is designated for its waterfowl and other bird species, as well as its hedgerows, bankside vegetation, otters, orchids and invertebrate population.
- Palmerston Park Woods LNR is a disused railway line approximately 4km west of the site.

Non-Statutory Designated Site Records

5.5.2 There are 6 non-statutory designated sites within 2km of the site.

- Tiverton Branch Railway
- May's Copse
- Dinhams
- High Street
- Doddeswick Farm (E)
- Lower Herne

5.5.3 Of these sites the most relevant is the Tiverton Branch Railway that runs approx. 280m to the south of the proposed development site.

Habitats and Vegetation

5.5.4 The vegetation and habitats observed onsite during 2020 remain very similar to those recorded during the original surveys. The site character continues to be dominated by the arable landscape, with most fields cultivated for barley or other arable crops. During the original habitat survey several fields had agriculturally improved grassland, and most of this has since been ploughed under and sown with arable crops. the crops are sown up to the field edges and consequently there is little in the way of field-margin vegetation.

5.5.5 The boundary hedgerows recorded during the original surveys all remain intact and have the same diversity of woody species. They retain the physical characteristics recorded during the original surveys, which included large earth banks supporting many of the hedges, and large standard trees dotted along the hedgerows. The field-layer vegetation under the hedges largely consists of semi-ruderal species (perhaps due to spray-drift from the adjacent fields) although some shade-tolerant species such as lords-and-ladies (*Arum maculatum*) and dog's mercury (*Mercurialis perennis*) were recorded.

5.5.6 Individual mature broadleaved trees mostly ash (*Fraxinus excelsior*) and oak (*Quercus robur*) are present throughout the hedgerows across the site, some of these are of considerable age and have the characteristics of veteran trees.

5.5.7 There was no evidence of invasive plant species being found during any of the surveys.

Fauna

Badgers

5.5.8 During previous surveys at the site, four active badger setts were recorded, all of these setts were located to the south of the area now under consideration close to the disused railway embankment.

5.5.9 During the 2020 surveys no setts, latrines or snuffle holes were observed. However it is likely that badgers forage across the site.

Bats

5.5.10 During the historic bat surveys undertaken at the site, nine species of bat were recorded as follows:

- common pipistrelle (*Pipistrellus pipistrellus*);
- soprano pipistrelle (*Pipistrellus pygmaeus*);
- noctule (*Nyctalus noctula*);
- Leisler's (*Nyctalus leisleri*);
- whiskered (*Myotis mystacinus*);
- serotine (*Eptesicus serotinus*);
- Daubenton's (*Myotis daubentonii*);
- greater horseshoe (*Rhinolophus ferrumequinum*); and
- lesser horseshoe (*Rhinolophus hipposideros*).

5.5.11 The vast majority of bat registrations were of the two pipistrelle species – which were regularly recorded foraging and commuting along the hedgerows. Horseshoe bats made up a very small proportion of the recordings.

5.5.12 During 2020 the bat surveys undertaken at the site recorded the following ten species of bat;

- common pipistrelle;
- soprano pipistrelle;
- noctule;
- serotine;
- Daubenton's;
- lesser horseshoe;
- brown long eared (*Plecotus auritus*);
- grey long eared (*Plecotus austriacus*)
- Brandt's (*Myotis brandtii*);
- Natterer's (*Myotis nattereri*).

5.5.13 As with the historic data the vast majority of the bat registrations were of the two pipistrelle species and the next most numerous bat species recorded was noctule with only occasional records of Brandt's and Daubenton's. Of the above

ten species; serotine, Natterer's, brown long eared, grey long eared and lesser horseshoe were only recorded on one occasion each. All of the bat species were recorded foraging and commuting along the hedgerows, with very little to no activity over the open fields.

5.5.14 The mix and abundance of species recorded during the 2013 and 2020 surveys is reflected in the results of the 2018 data search. This contains records of the same species, with the addition of three records of brown long eared (absent from the 2013 survey data) and without any records of Leisler's bat (which was recorded in 2013). The desktop data does not indicate that there are any significant roosts on or near to the site.

5.5.15 The original survey identified 21 trees with potential to support roosting bats within the area now under consideration. All of these trees are still present and have broadly the same features and roosting potential.

Breeding Birds

5.5.16 The original breeding bird surveys recorded 29 species across the site and in the local area the most common were woodpigeon (*Columba palumbus*), blackbird (*Turdus merula*), carrion crow (*Corvus corone*), rook (*Corvus frugilegus*), wren (*Troglodytes troglodytes*) and chaffinch (*Fringilla coelebs*). Notable species considered likely to be breeding on the site comprised linnet (*Carduelis cannabina*), song thrush (*Turdus philomelos*), dunnock (*Prunella modularis*) and bullfinch (*Pyrrhula pyrrhula*).

5.5.17 The desktop data obtained in 2018 contained records of 16 notable species; cuckoo (*Cuculus canorus*), reed bunting (*Emberiza schoeniclus*), spotted flycatcher (*Muscicapa striata*), house sparrow (*Passer domesticus*), marsh tit (*Poecile palustris*), bullfinch, lapwing (*Vanellus vanellus*), kingfisher (*Alcedo atthis*), hobby (*Falco subbuteo*), peregrine (*Falco peregrinus*), brambling (*Fringilla montifringilla*), green sandpiper (*Tringa ochropus*), redwing (*Turdus iliacus*), fieldfare (*Turdus pilaris*), red kite (*Milvus milvus*), and barn owl (*Tyto alba*). The mixed arable landscape with hedgerows and trees and the canal provide good habitat for most of these species within the vicinity of the site with

the exception of lapwing (the arable crops do not provide suitable nesting habitat) and green sandpiper (a coastal wading species).

5.5.18 The site has not changed significantly as of 2020 and it is likely that common farmland bird species will breed within the vegetation and individual trees dotted across the site.

Dormice

5.5.19 There are five records of dormice within the data obtain during 2018 including one record from scrub along the Grand Western Canal, approximately 1km away from the site.

5.5.20 The original dormouse surveys recorded nests from four locations in the far north east corner of the site and along the south western corner of the site. No nests were recorded from other areas of the site currently under consideration.

5.5.21 As of 2020 the hedges remain in good condition to support dormice, albeit some lack connectivity to others due to large gaps at gateways and field entrances.

Reptiles

5.5.22 No reptiles were recorded during the surveys in 2013, which covered a much larger area than that which is currently under consideration. The data obtained in 2018 indicated that there were only two records of reptiles within the search area: a grass snake (*Natrix helvetica*) and a slow worm (*Anguis fragilis*) both recorded from Chapel Anthony Lodge (approximately 1km from the site) in 2012 and 2013.

5.5.23 Surveys undertaken during 2020 have identified a population of slow worms in the far north western corner of the site closest to the nearby residential properties. A peak count of 10 adult slow worms was recorded on the 8th May 2020.

5.5.24 Two individual grass snakes, a juvenile and an adult were observed on the 5th May 2020 and the 14th May 2020 in two separate locations along the northern boundary of the site.

5.6 Evaluation and Mitigation

Designated Sites

5.6.1 The development is unlikely to have any direct adverse effects on designated sites subject to the adoption of suitable preventative measures. The site is sufficiently distant from Tidcombe Lane Fen that it is not directly hydrologically linked to it. The topography between the site and the Fen includes a shallow valley running east to west, but there is no continuous watercourse linking the two sites. Any proposed development would be bound to follow suitable measures to avoid runoff of soils or other materials into watercourses and therefore no effects are likely to occur.

5.6.2 The Grand Western Canal is buffered from any adverse effects by the presence of a continuous corridor of woodland and scrub, an earth bund and an agricultural field between it and the site. Subject to the adoption of standard measures to avoid runoff of soils or pollutants, the construction stage would be very unlikely to have any adverse effects on the canal. The design of drainage within and off the site for the operational phase will as a matter of course take account of the need to prevent pollution of watercourses, and there is therefore no likelihood that this will lead to an adverse ecological effect.

5.6.3 Palmerston Woods LNR is sufficiently distant from the site that no effects will occur from either the construction or operational phases of the development.

Habitat Quality

5.6.4 The majority of the site is of low ecological value, being intensively farmed arable land. This area will provide little to no benefit for wildlife due to the application of fertiliser, pesticides and the annual harvesting of crops. The limited ecological

benefits that this area currently provides can easily be enhanced as a result of the proposed development by creating areas of greenspace within the development with increased flora diversity and reduced management regimes.

5.6.5 The hedgerows that crisscross the site provide additional opportunities for wildlife and are considered to be of moderate ecological value. The development design will avoid the need for wholesale removal of these hedgerows, however in a few areas it will be necessary to breach these hedgerows in association with new roads.

5.6.6 It will be possible to mitigate and enhance the loss of this habitat, through sensitive landscape planting and the creation of sustainable urban drainage features that may introduce areas of standing water to the site.

5.6.7 The individual broadleaved trees across the site are all of high ecological value. They will provide opportunities for a number of different species and as a result of their age will be difficult to replace in the short term. All mature trees should be retained within the scheme design and measures should be implemented to ensure that they are protected from damage during the construction phase of the development.

Badgers

5.6.8 A precautionary approach during construction works will be implemented, including covering open trenches at night to prevent badgers and other small mammals getting in and becoming trapped.

5.6.9 There are no active setts within the area now under consideration, however historically setts have been recorded in the local area. It is recommended that prior to the commencement of construction onsite that a suitably experienced ecologist undertakes a site visit to search for any new excavations.

5.6.10 The removal of arable fields will lead to a reduction in foraging area, although in general intensively farmed arable fields are unlikely to provide optimum foraging opportunities for badgers.

5.6.11 The development design will need to ensure that habitat connectivity for badgers is retained and that the site and its surroundings remain accessible. Additional foraging opportunities can be created through the provision of greenspace within the development that will not be subject to intensive agriculture and therefore more likely to support the invertebrates that badgers consume.

Bats

Bat Roosting

5.6.12 The individual mature broadleaved trees throughout the hedgerows onsite may all act as occasional roosts for bats. The development does not proposed to remove any of these trees and sensitive lighting design will ensure that these trees are not artificially illuminated at night as a result of the proposed development.

5.6.13 The amount and quality of bat roosting habitat can be improved by providing new bat roosting boxes, both as built-in features on new dwellings and as boxes fixed to retained trees.

Bat Activity

5.6.14 Surveys have found that the site is used by a modest range of bat species, with the vast majority of bats recorded being the more common species. That being said all bat species are under pressure and are afforded protection.

5.6.15 The potential impacts of construction and occupation of the proposed development can be mitigated by ensuring that the development design allows for dark corridors along existing retained hedgerows. New areas of landscape planting if managed correctly will also provide additional foraging opportunities for all bat species.

Breeding Birds

5.6.16 The surveys indicate that, whilst the site is used by a number of species of conservation interest, it is not of significant importance to birds at anything other than a local level as the habitats onsite are common within the local area.

5.6.17 Of primary importance is the presence of species-rich hedgerows, the retention and long-term management of these features will be essential to ensure that the site remains suitable for the widest range of bird species. Any removal of vegetation onsite will where possible be undertaken outside of the bird nesting season. Should this not be possible then a suitably experience ecologist will inspect vegetation prior to its removal and if an active nest is identified then a suitable buffer will be implemented until the young have fledged.

5.6.18 The loss of the arable fields is likely to have limited impact upon birds, the intensive cropping and efficient harvesting mean that there is little food available for seed-eating farmland birds, and no nesting habitat suitable for those species such as skylarks and reed buntings that nest on the ground in meadows.

5.6.19 Additional nesting opportunities for bird species will be provided as a result of the proposed development. Nest boxes for a range of bird species will be installed upon retained vegetation and new houses throughout the site.

Dormice

5.6.20 The quality of habitat for dormice has not changed in any substantial way since the original surveys were conducted. It is reasonable to assume that dormice are still present, and that their abundance and distribution within the site is similar to that during the time of the original surveys.

5.6.21 The conclusions and recommendations of the original ecological assessment are still valid: in order to fulfil the obligations under the relevant policy and legislation the development proposal will need to demonstrate no net loss of suitable habitat.

5.6.22 The likely impacts of the proposed development are primarily that there will be additional breaches in hedgerows to accommodate access roads, and there is a potential impact from increased predation and disturbance by domestic pets that may eventually inhabit the residential dwellings.

5.6.23 The former potential impact can be mitigated by increasing connectivity overall, and planting of additional habitat. This planting will also mitigate the latter potential impact, in particular by planting thorny species (such as blackthorn) that will limit permeability to domestic pets.

5.6.24 In accordance with the original conclusions, a European protected species licence may be required in association with the construction stage of the project. This would include a detailed method statement detailing working methods that will need to be employed to reduce the risk of injury or death to dormice during construction and also details of the enhancement planting required to replace the opportunities lost.

5.6.25 The need for a licence will depend on the extent of habitat that would be affected.

Reptiles

5.6.26 Although during the survey in 2020 both grass snakes and slow-worms were found in discrete locations, it is likely that all areas of marginal habitat across the site will be used from time to time by these species.

5.6.27 In the absence of avoidance or mitigation there is a risk of injuring or killing reptiles during construction works onsite exists whenever vegetation is cleared. Construction works will be supervised by an ecologist to adequately reduce this risk. It may be necessary to demarcate a safe area for reptiles to be translocated to within the development site if they are encountered during construction works. Should these not be feasible onsite then an offsite receptor area may be required.

5.6.28 As a result of the development enhancements specifically targeting reptiles can also be secured. A reduction in the intensity of the management regime will benefit reptiles and hibernacula's such as log piles can also be constructed.

5.7 Conclusions

Verification of Existing Records

5.7.1 The verification survey and updated protected species surveys has confirmed that the conclusion of the original surveys which covered a much larger area remain valid and are sufficient to inform the design process and the assessment of this proposal.

Ecological Value

5.7.2 The majority of the site is currently occupied by habitats of low ecological value, and measures have been suggested to ensure that as a result of the development the landscaping and green spaces will provided enhanced opportunities for wildlife in comparison to those already provided by these habitats.

Ecological Protection and Enhancement

5.7.3 The measures required to ensure protection of the retained habitats onsite and to increase opportunities for biodiversity onsite can be secured via a Construction and Environmental Management Plan and a Landscape and Ecological Management Plan, which will include a monitoring programme, thresholds for intervention and remedial measures, and regular reporting to stakeholders.

5.7.4 Matters to address in the CEMP comprise:

- Protection of watercourses during construction;
- Protection of retained habitats onsite with particular focus on hedgerows
- and the individual broadleaved trees;
- A walkover survey to check for new badger excavations and measures

- to be implemented during construction to ensure that badgers do not
- become trapped in excavations or open works;
- Vegetation clearance to avoid the bird nesting season, or to be preceded
- by a nesting bird survey;
- Vegetation clearance designed to avoid impacts on dormice, under the
- terms of a European protected species licence;
- Reasonable Avoidance Measures that will be implemented during
- construction works to avoid the potential of injury or killing reptiles; and
- The installation of ecological enhancements including habitat creation,
- bat and bird boxes, hibernacula for reptiles, defensive planting for
- hedgerows and foraging habitat for badgers.

5.7.5 Matters to address within the LEMP include:

- Management of hedgerows to retain connectivity and a diverse
- structure; and
- Management of landscape planting for the long-term benefit of
- biodiversity.

6 Archaeology and Cultural Heritage

6.1 Introduction

6.1.1 This chapter addresses both above and below-ground 'heritage assets' and is based on the assessment carried out for the site by Cotswold Archaeology.

6.1.2 This chapter is supported by a Heritage Assessment and Geophysical Archaeological Magnetometer Survey, which can be found at technical appendices 6.1 and 6.2.

6.2 Policy Context

6.2.1 This assessment is written within the following legislative, planning policy and guidance context:

- Ancient Monuments and Archaeological Areas Act (1979)
- Planning (Listed Buildings and Conservation Areas) Act (1990)
- National Heritage Act 1983 (amended 2002)
- National Planning Policy Framework (2021)
- National Planning Practice Guidance: Conserving and Enhancing the Historic Environment (2019)
- Conservation Principles (Historic England 2008)
- Good Practice Advice in Planning: Note 2 (GPA2): Managing Significance in Decision-Taking in the Historic Environment (Historic England, 2015)
- Good Practice Advice Note in Planning: Note 3 (GPA3): The Setting of Heritage Assets, Second Edition (Historic England, 2017)
- Historic England Advice Note 12 (HEAN12) Statements of Heritage Significance: Analysing Significance in Heritage Assets (2019)
- Mid Devon District Council Development Plan (2013-33)
- Hedgerow Regulations (1997)

6.2.2 The National Planning Policy Framework's approach (henceforth the NPPF) is outlined in detail in Appendix 6.1

6.2.3 Local planning policy is set out within the Mid Devon Local Plan. Relevant policy is reproduced in Appendix 6.1.

6.3 Methodology and Scope

Assessing the significance of the effect of development

6.3.1 The significance of known and potential heritage assets within the site, and any beyond the site, which may be affected by the proposed development has been assessed and described, in accordance with paragraph 194 of the NPPF (July 2021), the guidance issued by CIfA (2020), Historic Environment Good Practice Advice in Planning Note 2 (NE 2015) and Advice Note 12: Statements of Heritage Significance: Analysing Significance in Heritage Assets (Historic England 2019). Determination of significance has been undertaken according to the industry-standard guidance on assessing heritage value provided within Conservation Principles (English Heritage 2008). This approach considers heritage significance to derive from a combination of discrete heritage values, principal amongst which are: i) evidential (archaeological) value, ii) historic (illustrative and associative) value, iii) aesthetic value, iv) communal value, amongst others. Further detail of this approach, including the detailed definition of those aforementioned values, as set out, and advocated, by Historic England, is provided in Appendix 1 of the Heritage Assessment (Technical Appendix 6.1).

6.3.2 Identified effects upon heritage assets have been defined within broad 'level of effect' categories (Table 6.1 below). These are consistent with key national heritage policy and guidance terminology, particularly that of the NPPF (2021). This has been done in order to improve the intelligibility of the assessment results for purposes of quick reference and ready comprehension. These broad determinations of level of effect should be viewed within the context of the qualifying discussions of significance and impact presented in the Heritage Assessment.

6.3.3 The overall effect of development proposals upon designated heritage assets are judged, bearing in mind both any specific harms or benefits.

6.3.4 In relation to non-designated heritage assets, paragraph 203 of the Framework states that:

> "*The effect of an application on the significance of a non-designated heritage asset should be taken into account in determining the application. In weighing applications that directly or indirectly affect non-designated heritage assets, a balanced judgement will be required having regard to the scale of any harm or less and the significance of the heritage asset".*

6.3.5 The NPPF does not employ the use of the terms 'substantial (or less than substantial) harm' with regard to non-designated heritage assets. However, for purposes of this assessment methodology it is deemed appropriate to apply the same terms for the 'scale of harm' to all types of heritage asset, whether designated or not.

6.3.6 To ensure that the language used within the EIA regulations is also incorporated within the assessment methodology it is considered that 'substantial harm' to any heritage asset (designated or not) would equate to a 'significant effect'. 'Less than substantial harm' to designated heritage assets of the highest significance could also trigger the same 'significant effect' but no prescriptive criteria is proposed to prejudge this threshold, leaving it to professional judgement.

Table 6.1 – Summary of level of effect categories

Level of effect	Description	Applicable statute and policy
Heritage benefit	The proposals would better enhance or reveal the heritage significance of the heritage asset.	Enhancing or better revealing the significance of a heritage asset is a desirable development outcome in respect of heritage. It is consistent with key policy and guidance, including the NPPF (2021) paragraphs 202 and 206.
No harm	The proposals would preserve the significance of the heritage asset.	Preserving a Listed building and its setting is consistent with s66 of the Planning (Listed Buildings and Conservation Areas) Act (1990). Preserving or enhancing the character or appearance of a Conservation Area is consistent with s72 of the Act. Sustaining the significance of a heritage asset is consistent with paragraph 190 of the NPPF (2021) and should be at the core

		of any material local planning policies in respect of heritage.
Less than substantial harm (lower end)	The proposals would be anticipated to result in a restricted level of harm to the significance of the heritage asset, such that the asset's contributing heritage values would be largely preserved.	In determining an application, this level of harm should be weighed against the public benefits of the proposals, as per paragraph 202 of the NPPF (2021). Proposals involving change to a Listed building or its setting, or any features of special architectural or historic interest which it possesses or change to the character or appearance of Conservation Areas, much also be considered within the context of Sections 7, 66(1) and 72(2) of the 1990 Act. The provisions of the Act do not apply to the setting of Conservation Areas. Proposals with the potential to physically affect a Scheduled Monument (including the ground beneath that monument) will be subject to the provisions of the Ancient Monuments and Archaeological Areas Act (1979): these provisions do not apply to proposals involving changes to the setting of Scheduled Monuments. With regard to non-designated heritage assets, the scale of harm or loss should be weighed against the significance of the asset, in accordance with paragraph 203 of the NPPF (2021).
Less than substantial harm (upper end)	The proposals would lead to a notable level of harm to the significance of the heritage asset. A reduced, but appreciable, degree of its heritage significance would remain.	
Substantial harm	The proposals would very much reduce the heritage asset's significance or vitiate that significance altogether.	Paragraphs 200-201 of the NPPF (2021) would apply. Sections 7, 66(1) and 72(2) of the Planning Act (1990) and the Ancient Monuments and Archaeological Areas Act (1979) may also apply. In relation to non-designated heritage assets, the scale of harm or loss should be weighed against the significance of the asset, in accordance with paragraph 203 of the NPPF (July 2021).

6.4 Baseline Conditions

Archaeological remains

6.4.1 The Heritage Assessment has identified that no designated archaeological remains are located within the site; no designated archaeological remains will therefore be adversely physically affected by development within the site.

6.4.2 Known and potential archaeological remains identified within the site comprise:

- Buried remains of a Neolithic ring ditch (of potentially moderate-high heritage significance)
- Buried remains of former cultivation activity and field boundaries (of, at most, low heritage significance); and
- Hedgerows/hedge banks bordering and running within the Site (heritage assets of low heritage significance)

6.4.3 The partial buried remains of a ring ditch (Fig. 3, 1), measuring 3.6m wide and 0.40m deep, dated to the Neolithic period and likely representing the remains of a plough levelled former funerary barrow, are recorded by previous archaeological investigations to be present within the south eastern extents of the Site. The identified surviving buried remains of the barrow will have evidential and historical (illustrative) value for the evidence that it may hold in contributing to developing our understanding of the pattern of settlement and associated activity established in this period along the Culm valley.

6.4.4 As a class of monument, round barrows are not rare (HE 2018), however their relative significance can be influenced by factors such as their state of survival/preservation, their form and their association with both similar adjacent monuments and/or other forms of associated burial practice (i.e. flat inhumations or cremations) that could be present (ibid). On the present understanding of the existing plough truncated state of the identified barrow remains within the Site, it would not currently be considered that these would be of equivalent significance to a designated asset (i.e. Scheduled Monument) as defined in the NPPF, although

subject to further investigation, the possibility that these remains could warrant such designation cannot presently be fully discounted when considered against their potential association with other similar noted monuments that lie in close proximity.

6.4.5 Trial trenching and geophysical survey conducted within the Site illustrates that it contains remains relating to its former cultivation of probable medieval/early post-medieval date, whilst analysis of LiDAR data indicates it to also contain former now infilled field boundaries, the location and orientation of which are consistent with the arrangement of field enclosures illustrated to occupy the Site on the 1843 Halberton Tithe map. Any below-ground remnants of these features (likely ditches or furrows) are unlikely to be of more than low heritage value (and buried furrows would likely be of insufficient heritage value to comprise 'heritage assets').

6.4.6 A moderate to high potential for the site to contain buried archaeological remains dating to the prehistoric period is identified based on evidence recorded both from within the Site itself and its immediate environs. Any remains of such activity/deposits, if present, would have evidential and historical (illustrative) value due to their potential to contribute to developing our understanding of the pattern of past occupation and use of the Site and its wider environs in this period. A low potential for any below ground remains dating all other periods is identified, other than possibly relating to the Site's agrarian use from the medieval/early post medieval period onwards, wherein the presence of any such remains would not be of a sufficient heritage value to be considered 'heritage assets'.

Historic landscape features

6.4.7 The hedgerows/ hedgebanks forming the western, southern and parts of the northern boundaries of the site, and within its south eastern extents, are likely to be considered 'important' under the Hedgerow Regulations 1997, and to comprise heritage assets of low heritage significance. 'Important' hedgerows do not comprise designated heritage assets, and do not confer a specific level of heritage significance. Rather, the Regulations are a notification mechanism by which sufficient notice of removal must be given to the local authority. The

associated hedgebanks themselves also have evidential and historical (illustrative) value for the evidence that they hold in contributing to our understanding of the formation and development of the agricultural landscape of the area. Limited removal if required for reasons such as access or circulation is normally achievable, if there is an overall design emphasis on retention.

Setting

6.4.8 Designated heritage assets which are potentially susceptible to impact as a result of any change to their setting as a result of the development proposal have been identified in accordance with the Second Edition of Historic England's 2017 'Good Practice Advice in Planning: Note 3, as:

- *Grand Western Canal Conservation Area* which contains a series of associated Grade II Listed Bridges and Milestone.

6.4.9 A subsequent site visit and study area walkover was conducted which further considered, amongst other factors, the surrounding topographic and environmental conditions, built form, vegetation cover, and lines of sight, within the context of the assets' heritage significance.

6.4.10 Based on the above analysis, there would be no non-physical impact upon the significance of any other heritage assets as a result of changes to the use and/or appearance of the site.

Table 6.2 Receptors

Sensitivity	Receptor
Designated heritage assets	Grand Western Canal Conservation Area, including Grade II Listed Bridges and Milestone
Non-designated heritage assets	Prehistoric features comprising below ground remains, including a Neolithic ring ditch Hedgerows

6.5 Identification and Evaluation of Key Likely Impacts

Construction

6.5.1 Construction within a greenfield site typically requires piecemeal but extensive below ground disturbance. Often this will involve the excavation of building foundation trenches, service trenches, larger areas of topsoil stripping for new road construction, ground reduction, and landscaping. These activities may disturb any buried archaeological remains. The extent of any disturbance will depend upon the nature, extent and level of survival of any underlying archaeological remains, and upon the nature of the construction activities undertaken, e.g. the depth of any foundation trenches.

6.5.2 Development within the site would most likely remove buried prehistoric remains, including the Neolithic ring ditch and other features identified by geophysical survey. The impact on the potential archaeology, prior to mitigation, will be **substantial harm** to a **non-designated heritage asset**. This is a 'significant effect' under EIA Regulations, and will be addressed via appropriate mitigation measures.

6.5.3 Current design plans indicate that the majority of hedgerows will be retained. Partial removal of hedgerows will result in **less than substantial harm** to a **non-designated heritage asset**. This level of harm is not considered to amount to a significant impact in the context of EIA regulations.

Operational

6.5.4 No operational impacts have been identified. The proposed development site does not contribute to the significance of designated heritage assets in the vicinity. Development proposals will not adversely impact designated heritage assets in the vicinity.

6.6 Mitigation Measures

Construction Phase

6.6.1 Current design plans indicate that the majority of historic hedgerows will be retained within the development.

6.6.2 A programme of archaeological mitigation works will be agreed with the Devon County Council Historic Environment Service, and implemented. The aim of these works will be to ensure that where it has not been possible to preserve archaeological remains and historic landscape elements *in situ*, they will be recorded prior to their disturbance. For archaeological remains, this may include investigation through stripping, mapping and sampling and excavation. For historic hedgerows and hedgebanks that will be removed, sections may be excavated through these features, with appropriate analysis and recording. It is anticipated that this will be achieved through a condition attached to any permission granted.

6.7 Residual Impacts

Construction Phase

6.7.1 Following the mitigation measures discussed above, the level of harm upon the non-designated heritage assets comprising below-ground remains will be reduced to **less than substantial harm**, due to their appropriate recording and advancement of our understanding of the heritage resource, as per NPPF guidelines (NPPF paragraph 205). This level of harm is not considered to amount to a significant impact in the context of EIA regulations.

6.8 Cumulative effects

6.8.1 No cumulative effects have been identified. The baseline survey has identified areas of potential archaeological remains, including a Neolithic ring ditch and features likely associated with prehistoric activity. There is no current evidence to indicate that directly associated remains extend beyond the site area. Therefore

no archaeological assets which would be subject to cumulative physical impacts have been identified.

6.8.2 No impacts on designated heritage assets resulting from alteration to setting have been identified. Therefore no designated assets are identified for assessment of cumulative impacts.

6.9 Summary and Conclusions

6.9.1 The proposed development will disturb or remove archaeological remains most likely associated with prehistoric funerary / settlement activity identified in the eastern area of the site. These will be recorded as part of a programme of archaeological mitigation, to be agreed with Devon County Council Historic Environment Service. Following mitigation, this will result in **less than substantial harm to a non-designated heritage asset**. This level of harm is not considered to amount to a significant impact in the context of EIA regulations.

6.9.2 The majority of historic hedgerows will be retained within the proposed development. Where lengths of historic hedgerows are to be removed this will result in **less than substantial harm to a non-designated heritage asset**. This level of harm is not considered to amount to a significant impact in the context of EIA regulations.

6.9.3 The setting of designated heritage assets in the vicinity of the proposed development site has been considered, in accordance with current English Heritage guidelines. The proposed development will not harm the heritage significance of these assets.

Table 6.3: Summary of Cultural Heritage Impacts

Impact	Impact Significance	Direct/ Indirect	Positive/ Negative	Temporary/ Permanent	Summary of Mitigation/ Enhancement	Residual Impact magnitude	Residual Impact significance	Positive/ Negative	Temporary/ Permanent	Confidence level
Construction										
Removal of buried prehistoric remains including the Neolithic ring ditch and other features identified by geophysical survey	Substantial harm to a non-designated heritage asset. A 'significant effect'	Direct	Negative	Permanent	A programme of archaeological mitigation works will be agreed with Devon County Council Historic Environment Service, an implemented.	Less than substantial harm to a non-designated heritage asset.	Not a 'significant effect'	Negative	Permanent	-
Partial removal of hedgerows.	Less than substantial harm to a non-designated heritage asset	Direct	Negative	Permanent	A programme of archaeological mitigation works will be agreed with Devon County Council Historic Environment Service, an implemented.	Less than substantial harm to a non-designated heritage asset.	Not a 'significant effect'	Negative	Permanent	-
Operational										
No operational impacts have been identified										

7 Transport and Accessibility

7.1 Introduction

7.1.1 This Chapter of the Environmental Statement assesses the transport impact of the proposed development during the construction period and after completion during the operation of the development. It describes the assessment methodology, the baseline conditions existing at the assessment site and surroundings, the likely significant environmental effects, the mitigation measures required to prevent, reduce or offset any significant adverse effects, and the likely residual effects after these measures have been employed.

7.1.2 This Chapter (and its associated figures and appendices) is not intended to be read as a standalone assessment and reference should be made to the whole Environmental Assessment and associated documents and plans. Reference should also be made to the Transport Assessment (Technical Appendix 7.1).

7.2 Policy Context

7.2.1 Planning policy at the national, regional, county and local level is discussed in Chapter 3 Policy Context. The TA provides a comprehensive review of planning policy specific to traffic and transport including:

- National Planning Policy Framework 2019
- Devon Local Transport Plan: Devon & Torbay Strategy 2011-2026
- Mid Devon Local Plan 2013 – 2033
- Manual for Streets (MfS) 2007

7.2.2 In summary, key transport policy at a national, regional and local level includes:

- Promoting travel by sustainable modes including walking, cycling and public transport;
- Improving safety for all road users;
- Reducing the overall need to travel;
- Supporting travel management measures.

Guidance

7.2.3 The assessment uses guidance for conducting and reporting Transport Assessments produced by the Department for Transport (DfT), entitled 'Guidelines on Transport Assessment'. Published in March 2007, this guidance is considered to be the most appropriate for producing transport assessments.

7.2.4 Whilst the DfT guidelines are considered best practice for traffic assessments they do not establish best practice for transport assessment associated with environmental impact assessment.

7.2.5 The DfT guidance therefore cross references its best practice with that published by the Institute of Environmental Assessment (IEA) (now The Institute of Environmental Management & Assessment (IEMA)). This guidance note *'Guidance Note No 1. - Guidelines for the Environmental Assessment of Road Traffic'* published in October 1993, sought to address the differences between the assessment of traffic associated with the operational performance of the local highway network and that of its effects on local receptors.

7.2.6 The methodology used in this assessment follows the IEA guidance and also relies upon the professional competence of the traffic consultant, as expected in the guidance:

> *'These Guidelines are intended to complement professional judgement and the experience of trained assessors.'*

7.2.7 That document suggests that the scale and extent of the assessment should be limited to highway links subject to traffic flow increases of more than 30% (10% if affecting a sensitive area) or the number of Heavy Goods Vehicles (HGV's) will increase by more than 30%. Sensitive areas are defined by the presence of sensitive receptors, such as congested junctions, hospitals, community centres, conservation areas, schools, colleges or accident black spots.

7.2.8 This note sets out the recommended list of likely environmental impacts which could be considered as potentially significant whenever a new development is likely to give rise to changes in traffic flows. These include:

- Driver severance and delay;
- Pedestrian severance and delay;
- Pedestrian amenity;
- Fear and intimidation;
- Accidents and safety; and
- Hazardous and dangerous loads.

7.2.9 Detailed analysis of appropriate guidance has been undertaken within the TA accordingly. Guidance on the direct derivation of assessment years, analysis periods and trip generation are discussed in the TA and are of particular relevance to this Chapter.

7.3 Methodology and Scope

Scope of the assessment

7.3.1 In the course of developing and preparing the Transport Assessment consultation has taken place between the design team and Devon County Council as local highway authority.

7.3.2 This has provided clarity on specific issues which Devon County Council wish to see addressed in the assessment and thus allowed the work reported here to include those issues.

7.3.3 Discussions have also taken place with the Highways Agency (HA), which is responsible for the M5 and has an interest in the main junctions on these routes.

7.3.4 The discussions indicated that the Transport Assessment should consider the transport impact at the junctions of Blundell's roundabout, Lowman roundabout, Gornhay southern roundabout and M5 Junction 27. In addition another seven junctions within the area of the EUE have also been assessed.

7.3.5 In accordance with the IEMA guidelines and the scoping report the following conditions on the road network have been assessed:

- Severance;
- Driver stress and delay
- Pedestrian amenity and delay;
- Cyclist amenity and delay;
- Fear and intimidation; and
- Accidents and safety.

7.3.6 Key issues including the impact of the traffic generated on the local highway network are outlined and assessed below. Safety, sustainability, the promotion of a modal shift, and the enhancement of public transport links have also been considered.

Extent of the study area

7.3.7 In accordance with the IEMA Guidelines on the Environmental Assessment of Road Traffic (Ref 9.1) an assessment of sensitive receptors has been undertaken identifying the proximity of each to the local highway network. Sites which are considered to be sensitive receptors are:

- Conservation areas;
- Schools;
- Health facilities (such as GP surgeries, dental practices etc.);
- Community facilities (such as parks, community centres etc,) and
- Congested junctions.

7.3.8 The following road links have been considered within this Chapter:

- M5 J27;
- A361;
- A396 Heathcoat Way;
- Lea Road;
- Lowman Way;
- A396 Great Western Way;
- Blundell's Road;
- Proposed Link Road from Blundell's Road to the new A361 junction;
- Uplowman Road; and
- Post Hill

Assessment Scenarios

7.3.9 The assessment of the traffic impact of the scheme has been based upon the traffic model developed by Devon County Council in association with proposals for the Tiverton Eastern Urban Extension. The base year for the model is 2011. The Mid Devon LDF Core Strategy, adopted in July 2007, covers the period to 2026, as does the Allocations and Infrastructure Development Plan Document. The forecast year for the modelling is therefore 2026, by which date it is assumed that the Tiverton Eastern Urban Extension will be complete.

7.3.10 The traffic model runs were undertaken by Devon County Council during 2014, and are based upon the development scenarios within section 4.2 of the

Consultation Draft Masterplan SPD for Tiverton's New Neighbourhood at Post Hill, December 2013. This assumed a total of 1550 dwellings and 35,000 sqm employment (substantially below the 1,500 – 2,000 dwellings and 95,000 – 130,000 sq m originally envisaged in Policy AL/TIV/1 of the Allocations and Infrastructure DPD).

7.3.11 The amended Masterplan SPD adopted by Mid Devon District Council in April 2014 contained slightly revised proposals, amounting to 1522 dwellings and 30,000 sqm employment. The traffic generation of the EUE is therefore slightly greater than the revised development levels.

7.3.12 The Hartnoll Park development has been assessed using a spreadsheet analysis with traffic generation added to the Tiverton traffic model data. The trip distribution used is similar to that predicted for the EUE.

7.3.13 The SPD sets out a number of strategic transport proposals that are required in support of the EUE. These include:

- A new junction onto the A361 and provision of link road connecting to Blundell's Road.
- Traffic calming and environmental enhancement to Blundell's Road
- Improvements to roundabouts on Heathcoat Way
- Investigations into whether the development warrants improvements to M5 Junction 27

7.3.14 At the time of writing (March 2015) the improvements to Junction 27 are under construction and consist of the signalisation of the slip roads. The planning application for the full A361 Junction has now been approved and funding has been applied for by DCC. Funding towards the junction will also be provided by Waddeton Park Ltd and the Chettiscombe Trust. The improvements to Blundell's Road and the Heathcoat Way roundabouts are implicit in the 2026 networks.

7.3.15 The assessment of the likely significant impact of the trips generated by the development has been carried out for the base year of 2015 (growthed from the

2011 traffic model base year) and for a 2026 future year when the development will be complete.

7.3.16 Assessments have therefore be undertaken for the following AM and PM peak scenarios:-

- 2015 Survey year – this is without developments to produce a baseline against which the highway impact can be considered against;
- 2026 with the Committed EUE development of 1550 dwellings and 35,000sqm of employment;
- 2026 with the EUE development and addition of Hartnoll Park 1000 dwellings and 24,000sqm of employment.

Desk study

7.3.17 The baseline conditions have been derived through a desktop review of the following information:

- Ordnance Survey 1:25,000 map of the local area;
- Google Earth, Google Earth Street View and other available mapping on the internet;
- Data on public transport services extracted from The Devon County Council (DCC) website and other available information on the internet such as 'transportdirect'; 'traveline' and 'thetrainline';
- Accident / collision data from DCC for five years from 01/01/2009 to 31/12/2013.
- Public rights of way from gis.devon.gov.uk
- Cycle routes from gis.devon.gov.uk and www.sustrans.org.uk

Site Walkovers and Surveys

7.3.18 The baseline conditions described below have been derived through the following site survey work:

- Site walkovers have been undertaken by PCL Transport Ltd. The purposes of the site visits was to observe the general characteristics of the highways; take some on-site measurements; take site photographs; and observe traffic behaviour;

- Topographical survey of the proposed development site have been undertaken to allow masterplan design;
- Traffic count at the access junction to Hartnoll Business Park

Information provided by the design team

7.3.19 Relevant information provided by the design team has been considered and used in the assessment where applicable. This has included:

- Master plans of the proposed development; and
- Description of the development proposals.

Construction Traffic

7.3.20 The amount of construction traffic is difficult to predict and in order to give a realistic impression research has been undertaken of the Construction Management Plans submitted for similar sized developments.

7.3.21 Access to the site for construction traffic is likely to be via the existing Hartnoll Business Park access. Working hours will be agreed with the Planning Authority and are likely to be from 08.00-18.00 weekdays and 08.00-13.00 on Saturdays.

Assessment of the Development's Likely Significant Impact

7.3.22 In accordance with the IEMA Guidelines on the Environmental Assessment of Road Traffic an assessment of sensitive receptors has been undertaken identifying the proximity of each to the local highway network. Sites which are considered to be sensitive receptors are:

- Conservation areas;
- Schools;
- Health facilities (such as GP surgeries, dental practices etc.);
- Community facilities (such as parks, community centres etc,) and
- Congested junctions.

Assessment modelling

7.3.23 The assessment of the proposed development of up to 1000 residential dwellings and 24000sqm of employment has been undertaken using data from the DCC traffic model of Tiverton combined with a spreadsheet traffic model. The 2026

base year has included the SPD allocated sites with the exclusion of the Eastern Urban Extension (EUE) but includes the new A361 junction. The 2026 assessments also include the addition of the EUE to the base situation and then the EUE combined with the Hartnoll Park development.

Significance Criteria

7.3.24 The significance of an effect is determined by the interaction of two factors, first the magnitude, scale or severity of change due to the development proposals, and secondly, the value, importance or sensitivity of the environmental resource being affected.

7.3.25 The significance of levels of traffic change varies depending on the environmental impact criteria being considered, eg, severance, driver delay, etc. As set out in para. 4.5 of the IEMA guidelines:

> *"For many effects there are no simple rules or formulae which define thresholds of significance and there is, therefore a need for interpretation and judgement on the part of the assessor, backed up by data or quantified information wherever possible."*

7.3.26 Magnitude of change and the sensitivity of the affected receptor or receiving environment are both assessed on a scale of Major, Moderate, Minor and Negligible in accordance with the IEMA Guidelines.

7.3.27 The following terms have been used to define the significance of the impacts identified:

- **Major impact**: Total major alteration to key elements or features of the baseline (pre-development) conditions such that the post development character, composition and attributes will be fundamentally changed.
- **Moderate impact**: Alteration to one or more key elements or features of the baseline conditions such that post-development character, composition and attributes of the baseline will be materially changed.
- **Minor impact**: A minor shift away from the baseline conditions; change arising from the alteration will be discernible and detectable but not material. The underlying character, composition and attributes of the baseline condition will be similar to the pre-development circumstances/situation; and

- **Negligible**: Very little change from baseline conditions; change barely distinguishable, approximating to a 'no change' situation.

Geographical level of importance

7.3.28 Each of the receptors was also assigned a 'sensitivity' level. The varying sensitivity levels are outlined in **Table 9.1** and are partially considered from a geographical level of importance.

Table 7.1: Geographical level of importance

Magnitude of Impact	Sensitivity of Receptor			
	Very High (International)	High (National/UK)	Medium (County/ Regional)	Low (District/ Local)
Major Impact	Substantial	Substantial	Moderate	Slight
Moderate Impact	Substantial	Moderate	Slight	Negligible
Minor (Slight) Impact	Moderate	Slight	Slight	Negligible
Negligible	Slight	Negligible	Negligible	Negligible

Impact Significance

7.3.29 The following possible impact areas, considered by the IEMA guidelines to be potentially significant when a new development is likely to result in a change in traffic flows, have been considered and assessed in respect of the proposals.

7.3.30 ***Severance*** - This is the perceived division that can occur within a community when it becomes separated by a major traffic route. The guidelines suggest that a 30% (or 10% in sensitive areas), 60% and 90% increase in traffic flow will respectively have a slight, moderate and substantial change in severance. However, allowance needs to be made for the presence of existing crossing facilities.

7.3.31 The following definitions are adopted for the assessment of severance impacts of the Development:

- Substantial adverse: Change in traffic +90% or above
- Moderate adverse: Change in traffic +60% to +90%
- Minor (slight) adverse: Change in traffic +30% to +60%
- Insignificant: Change in traffic –30% to +30%
- Minor (slight) beneficial: Change in traffic –60% to –30%
- Moderate beneficial: Change in traffic –90% to –60%
- Substantial beneficial: Change in traffic –90% or above

7.3.32 ***Driver Delay*** – Such delays can occur: at the site entrances; on the highways passing the site, and at key junctions on the nearby highway network. The level of vehicle delay and the value of the delay can be determined using junction or network modelling software. However, there is only likely to be a significant impact where the network is at, or close to, capacity.

7.3.33 The following definitions are adopted for the assessment of driver delay impacts of the Development:

- Substantial adverse: Change in traffic +90 seconds or above
- Moderate adverse: Change in traffic +60 to +90 seconds
- Minor (slight) adverse: Change in traffic +30 to +60 seconds
- Insignificant: Change in traffic –30 to +30 seconds
- Minor (slight) beneficial: Change in traffic –60 to –30 seconds
- Moderate beneficial: Change in traffic –90 to –60 seconds
- Substantial beneficial: Change in traffic –90 seconds or above

7.3.34 ***Pedestrian Delay*** - Developments generally result in an increase in the number of vehicle and pedestrian movements. Increases in traffic levels are likely to lead to greater increases in delay to pedestrians seeking to cross roads. The guidelines recommend the assessor should use judgment to determine whether there is a significant impact to pedestrian delay. Significance should be considered in the context of the pedestrian flows and the availability of gaps in traffic for pedestrians to cross.

7.3.35 ***Pedestrian Amenity*** - The guidelines broadly define this as the relative pleasantness of a journey as affected by traffic flow, traffic composition, footway width and separation from traffic. A tentative threshold for changes in pedestrian amenity is where traffic flows are halved or doubled. Such a change would be considered significant.

7.3.36 The following definitions are adopted for the assessment of pedestrian amenity impacts of the Development:

- Substantial adverse: Change in traffic +50% or above
- Moderate adverse: Change in traffic +30% to +50%
- Minor (slight) adverse: Change in traffic +10% to +30%
- Insignificant: Change in traffic –10% to +10%
- Minor (slight) beneficial: Change in traffic –10% to –30%
- Moderate beneficial: Change in traffic –30% to –50%
- Substantial beneficial: Change in traffic –50% or above

7.3.37 ***Fear and Intimidation*** - This impact is dependent on the volume of traffic, its HGV composition and its proximity to people or the lack of protection caused by factors such as narrow footway widths. The guidelines suggest thresholds based on 18-hour daily flow, 18-hour HGV flow and vehicle speeds, as shown in **Table 7.3.**

Table 7.3: Fear and Intimidation Thresholds

Degree of Hazard	Average traffic flow over 18-hour day (vehicle / hour)	Total 18-hour HGV Flow	Average speed over 18-hour day (mph)
Extreme	1800+	3000+	20+
Great	1200-1800	2000-3000	15-20
Moderate	600-1200	1000-2000	10-15

7.3.38 The traffic components can be weighted to give an overall score of fear and intimidation corresponding to particular combinations of traffic flow, speed and vehicle type composition. As HGV flows and speed are not considered to be significant factors in the area the following definitions have been used to determine fear and intimidation:

- Substantial adverse: Average hourly traffic 1,800 or more vehicles
- Moderate adverse: Average hourly traffic 1,200 to 1,800 vehicles
- Minor (slight) adverse: Average hourly traffic 600 to 1,200 vehicles
- Insignificant: Average hourly traffic up to 600 vehicles
- Minor (slight) beneficial: (if degree of hazard reduced by one category)
- Moderate beneficial: (if degree of hazard reduced by two categories)
- Substantial beneficial: (if degree of hazard reduced by three categories)

7.3.39 ***Accidents and Safety*** - Accident rates for links and junctions can be obtained and therefore the proposed increase in traffic can be used to calculate the likely impact upon road traffic accidents. Eight years of accident data between 2006 and 2013 was studied. An analysis and interpretation of the data, together with professional judgement to assess the implications of local circumstances that could heighten or lessen risks of accidents, is included in this assessment chapter.

7.3.40 **Hazardous Loads -** It is not anticipated that Hazardous Loads will need to be transported during the phases associated with the removal of materials from the

site, throughout construction or during subsequent occupation. Therefore, this is not considered further within this assessment.

7.4 Baseline Conditions

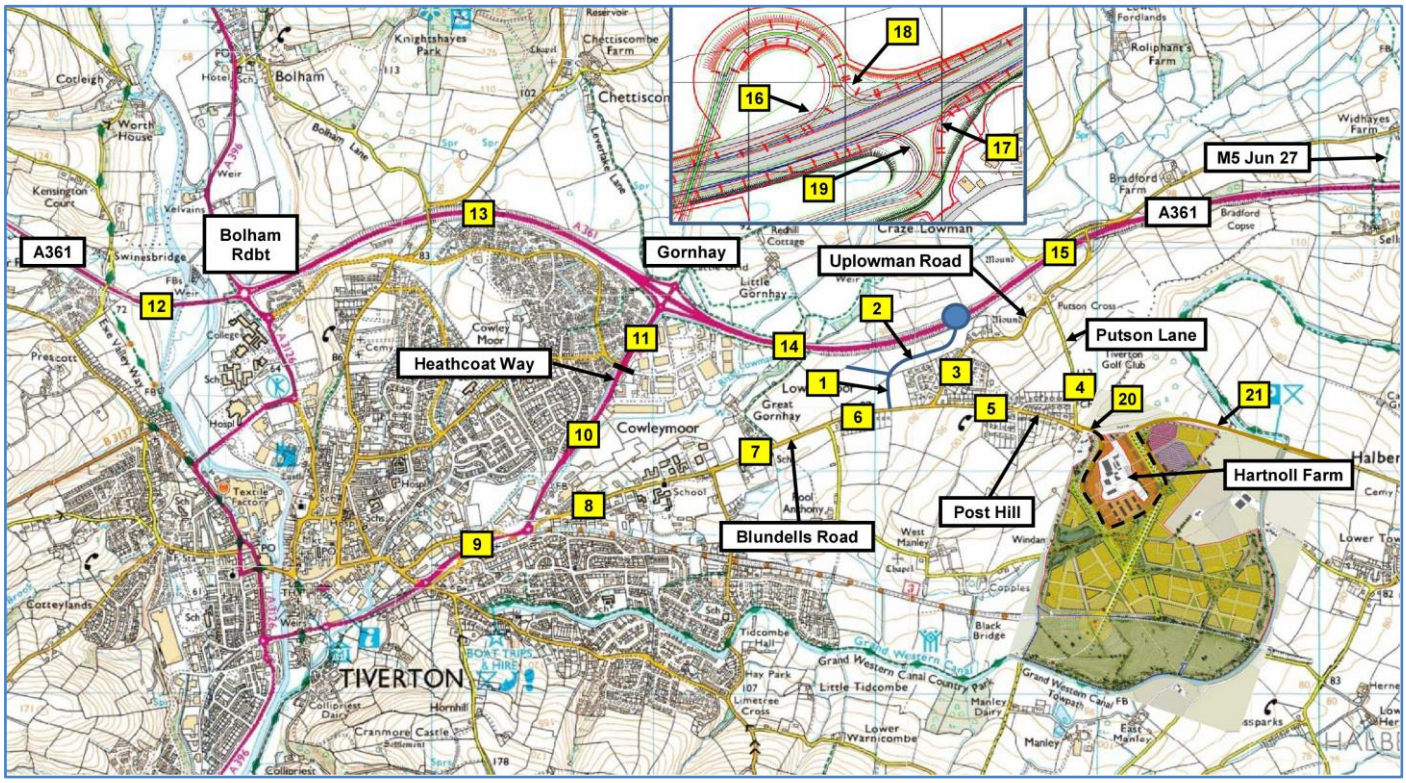
Site location and local highway network

7.4.1 The development site lies approximately 4km to the east of Tiverton town centre, immediately south of the Tiverton Golf Club.

7.4.2 A total of eleven junctions have been identified that will experience changes in transport impacts as a result of the proposed development. These junctions have been considered due to their proximity to the development site and sensitive receptors. The junctions assessed are:

- J1: T-junction of Putson Lane with Post Hill
- J2: T-junction of eastern access to the EUE
- J3: T-junction of Uplowman Road with Blundell' Road
- J4: Roundabout junction with link road to new A361 junction
- J5: Ghost island T-junction to employment area
- J6: Blundell's Roundabout
- J7: Lowman Way Roundabout
- J8: Gornhay Roundabout
- J9: Roundabout junction forming part of the A361 Interchange
- J10: Slip roads of the A361 Interchange
- J11: Junction 27 of the M5

7.4.3 In addition to the junctions various links of the highway network have been assessed in terms of the effect on air quality and noise. **Figure 7.1** below shows the local highway network surrounding the site indicating the 21 links.



7.4.4 **Tables 7.3 and 7.4** presents a summary of the two-way vehicular flows on these links for the am and pm peak hours for the base year of 2015 and the future base year 2026 (including the A361 Link Road and Junction 27 improvements). The difference in flows between the two situations is shown and indicates the beneficial effects resulting from construction of the A361 Link Road. It should be noted that the 2026 situation is a theoretical case as the Link Road is dependent on the development of the Eastern Urban Extension.

Table 7.3: AM Peak Hour Two-Way Link Flows in 2015 Base and 2026 Base (which includes the A361 Link Road)

Link		2015 Base	2026 Base	Change	Growth
Description	Link No	AM Peak	AM Peak	PCU	%
A361 Link close to Blundells Road	1	0	297	297	>100%
A361 Link close to A361	2	0	297	297	>100%
Uplowman Road (at Blundells Rd junction)	3	155	182	27	18%

Golf Course Lane (just north of Post Hill junction)	4	11	12	1	5%
Post Hill (east of Uplowman Road)	5	526	519	-7	-1%
Blundells Road (East)	6	689	655	-34	-5%
Blundells Road (Centre)	7	783	707	-76	-10%
Blundells Road (near School)	8	908	663	-245	-27%
Great Western Way	9	1709	1728	19	1%
Heathcoat Way (south)	10	1323	1342	19	1%
Heathcoat Way (north)	11	1316	1501	185	14%
A361 (West of Bolham Roundabout)	12	1329	1545	216	16%
A361 (Bolham to Gornhay)	13	1710	2109	399	23%
A361 (Gornhay to new A361 junction)	14	2596	3187	591	23%
A361 (A361 junction to M5)	15	2596	3108	512	20%
A361 eastbound off slip	16	0	106	106	>100%
A361 westbound off slip	17	0	48	48	>100%
A361 eastbound on slip	18	0	61	61	>100%
A361 westbound on slip	19	0	82	82	>100%
Post Hill (east of Putson Lane)	20	543	518	-25	-5%
Post Hill (east of Manley Lane)	21	541	510	-31	-6%

Table 7.4: PM Peak Hour Two-Way Link Flows in 2015 Base and 2026 Base (which includes the A361 Link Road)

Link		2015 Base	2026 Base	Change	Growth
Description	Link No	PM Peak	PM Peak	PCU	%
A361 Link close to Blundells Road	1	0	353	353	>100%
A361 Link close to A361	2	0	353	353	>100%
Uplowman Road (at Blundells Rd junction)	3	202	228	26	13%
Golf Course Lane (just north of Post Hill junction)	4	15	16	1	10%
Post Hill (east of Uplowman Road)	5	530	553	23	4%
Blundells Road (East)	6	744	616	-128	-17%
Blundells Road (Centre)	7	839	658	-181	-22%
Blundells Road (near School)	8	953	659	-294	-31%
Great Western Way	9	1760	1776	16	1%
Heathcoat Way (south)	10	1419	1425	6	0%
Heathcoat Way (north)	11	1288	1535	247	19%
A361 (West of Bolham Roundabout)	12	1333	1554	221	17%
A361 (Bolham to Gornhay)	13	1717	2176	459	27%
A361 (Gornhay to new A361 junction)	14	2646	3349	703	27%
A361 (A361 junction to M5)	15	2646	3183	537	20%
A361 eastbound off slip	16	0	109	109	>100%
A361 westbound off slip	17	0	51	51	>100%
A361 eastbound on slip	18	0	42	42	>100%
A361 westbound on slip	19	0	151	151	>100%
Post Hill (east of Putson Lane)	20	543	541	-2	0%
Post Hill (east of Manley Lane)	21	543	523	-20	-4%

Walking and cycling

7.4.5 A 2m wide footway is present along the southern side of the C769 road approximately 120m to the west of the access to the Hartnoll Business Park, with a narrow footpath starting from the junction with Manley Lane that leads to a footway. The footway continues on the southern side of Post Hill until beyond the Fairway bus stop where it terminates.

7.4.6 A footway on the northern side of the road starts 270m to the west of the access to the Hartnoll Business Park and provides good facilities for pedestrians along the full length of Blundell's Road into Tiverton. At Blundell's School and also at a point close to Blundell's roundabout two signal controlled pedestrian crossings are available and allow safe crossing of Blundell's Road.

7.4.7 The existing cycling routes in the vicinity of the site are identified in **Figure 7.2** below.

- *Figure 7.2. Extract from Tiverton Cycle Map*

7.4.8 The Tiverton & Culm Valley Cycle Routes are within easy access of the site. The Lowman Valley Cycle Route shown purple is routed via Manley Lane and Putson Lane on the western boundary of the site and links into the West Country Way (NCN3) shown in green. The latter connects into Tiverton along a disused railway line and is therefore level and well suited for cycling.

Public transport

7.4.9 The existing provision of public transport within the vicinity of the site is described in detail within the TA.

7.4.10 **Table 7.5** below summarises the local bus services which are within 400m walking distance of the site.

Table 7.5: Summary of local bus services

Bus Service	Bus Stop	From	To	Route	Frequency (per direction)
1/1A/1B	*Fairway*	*Tiverton*	*Exeter*	*Halberton – Tiverton Parkway – Willand – Cullompton*	*Hourly Monday to Saturday (every 2 hours on Sunday)*
22	*Fairway*	*Cullompton*	*Taunton*	*Willand – Tiverton – Halberton – Wellington*	*5 daily trips Monday to Saturday*
397	*Fairway*	*Hemyock*	*Tiverton*	*Culmstock – Holcombe Rogus – Sampford Peverell – Uplowman*	*1 daily trip on Friday*

7.4.11 These services provide connection to Tiverton and other regular bus services to Exeter, Barnstable and Crediton. The closest bus stop is Fairway on both sides of Post Hill, approximately 250m from the development site, and is considered to be within a reasonable walking distance of the development. The bus stops consist of bus lay-bys on both sides of the road. The existing services are adequate to cater for the development although it may be possible to increase the frequency of service if demand exceeds existing capacity.

Accidents and safety

7.4.12 Personal injury accident statistics have been obtained from past Transport Assessments and updated to December 2013 with data from DCC. The accident study covers a 5 year period between January 2009 and December 2013.

7.4.13 The number of accidents was low with the majority resulting in slight injuries.

7.4.14 Based on the analysis of the accidents which have occurred during the study period, no particular pattern has been identified and there are no existing highway safety concerns.

7.5 Likely impacts

Construction Traffic

7.5.1 The application is in outline, so the level and programming of construction traffic is difficult to predict at this stage. Construction traffic volumes have been estimated for this assessment based on similar developments elsewhere.

7.5.2 Construction activities would not only include the building of residential and employment development, but would involve civil engineering works to provide new roads and other infrastructure. This will give rise to deliveries of materials and products that would be transported by heavy goods vehicles.

7.5.3 Construction traffic is temporary and will have a relatively short-term effect on some existing roads within the local highway network. Although the proposed development will involve works on a large construction site the level of traffic delivering to the site is expected to be relatively low. The design of infrastructure will minimise earthworks, and it is not expected that there would be substantial quantities of soil to be removed from the site.

7.5.4 It is estimated that even during busy construction periods it is unlikely that the number of HGV two-way trips to the site would exceed 60 per day. It is also unlikely that the majority of deliveries would occur during peak traffic periods on the highway network.

7.5.5 In addition, there would be construction employees on site, the number of which will vary according to construction activity. Many construction companies transport their employees in work buses and therefore the estimated employee vehicle generation is unlikely to exceed 100-150 two-way trips per working day at the peak of construction.

7.5.6 The effects of construction traffic on the capacity of the highway network would be significantly less than the operational phase of the development.

7.5.7 Traffic routes used by construction vehicles when delivering goods and material to and from the site will be agreed with Mid Devon Council and other relevant authorities, such as DCC prior to construction activity commencing. It is proposed that the construction vehicle movements will be restricted to the main routes with access for HGVs from the new A361 junction ensuring vehicles will only impact on a minimal number of local residents.

7.5.8 In light of the above it is considered that during the construction phase of the development the magnitude of the impact on driver and pedestrian severance and delay, pedestrian amenity, fear and intimidation and accidents and safety will be minor. As construction traffic could have a local or county-wide effect, by reference to Table 9.1 the significance of the effects is considered to be slight to negligible.

7.5.9 A Construction Environmental Management Plan (CEMP) will be implemented to mitigate the impacts associated with the construction phase of the development.

Development Traffic on Completion

7.5.10 The number of trips to and from the proposed 1000 houses and 24000sqm of employment has been assessed using the TRICS database as detailed in the Transport Assessment. In total across all modes of transport, it is estimated that the development will generate approximately 1413 two-way person trips (560 arrivals and 854 departures) during the am peak hour. Similarly, it is estimated that the development will generate approximately 1331 two-way person trips (666 arrivals and 665 departures) during the pm peak hour. The resulting number of trips forecast to be made by each mode has been calculated using the mode shares derived from the TRICS database. It should be noted that these mode shares are based on trip rates from around the country and will be affected by local factors and the application of a Travel Plan.

7.5.11 Based on the TRICS data the trips forecast by each mode are shown in **Table 7.6** below:

Table 7.6: Development Trips by Mode

Trips	am peak			pm peak			0700 – 1900 (12 hours)		
	in	out	Two-Way	in	out	Two-Way	in	out	Two-Way
Pedestrians	60	161	221	89	83	172	837	879	1716
Public Transport	15	24	39	17	13	30	85	83	168
Cyclists	12	16	28	16	16	33	111	110	221
Car Driver	402	451	853	422	444	866	3640	3738	7378
Car Passenger	70	201	272	122	109	231	963	1069	2032
Total People	560	854	1413	666	665	1331	5635	5878	11514

Assessment of Links

7.5.12 In order to assess the impact of the development two-way peak hour traffic flows have been forecast for a future year of 2026. The base situation includes the development of the full Tiverton Urban Extension with the A361 junction open to traffic and is compared with the same situation but including the Hartnoll Park development. **Tables 7.7 and 7.8** shows the comparison of flows for the AM and PM peaks respectively based on the key diagram shown in **Figure 7.1.**

Table 7.7: 2026 Predicted AM Peak Hour Flows, with and without Development

Link		2026 With EUE	2026 with EUE & Hartnoll Park	Difference	Growth
Description	**Link No**	**PCU**	**PCU**	**PCU**	**%**
A361 Link close to Blundells Road	1	945	1435	490	52%
A361 Link close to A361	2	1039	1528	489	47%
Uplowman Road (at Blundells Rd junction)	3	57	57	0	0%
Golf Course Lane (just north of Post Hill junction)	4	272	272	0	0%
Post Hill (east of Uplowman Road)	5	840	1484	644	77%
Blundells Road (East)	6	988	1142	154	16%
Blundells Road (Centre)	7	985	1168	183	19%
Blundells Road (near School)	8	897	1051	154	17%
Great Western Way	9	1842	1917	75	4%
Heathcoat Way (south)	10	1277	1234	-43	-3%
Heathcoat Way (north)	11	1736	1891	155	9%
A361 (West of Bolham Roundabout)	12	1546	1547	1	0%
A361 (Bolham to Gornhay)	13	2224	2300	76	3%
A361 (Gornhay to new A361 junction)	14	3600	3872	272	8%
A361 (A361 junction to M5)	15	3135	3131	-4	0%
A361 eastbound off slip	16	381	562	181	48%
A361 westbound off slip	17	164	240	76	47%
A361 eastbound on slip	18	123	164	41	33%

A361 westbound on slip	19	371	562	191	51%
Post Hill (east of Putson Lane)	20	535	1177	642	120%
Post Hill (east of Hartnoll Park development)	21	533	544	11	2%

Table 7.8: 2026 Predicted PM Peak Hour Flows, with and without Development

Link		**2026 With EUE**	**2026 with EUE & Hartnoll Park**	**Difference**	**Growth**
Description	**Link No**	**PCU**	**PCU**	**PCU**	**%**
A361 Link close to Blundells Road	1	1031	1538	507	49%
A361 Link close to A361	2	1124	1632	508	45%
Uplowman Road (at Blundells Rd junction)	3	65	65	0	0%
Golf Course Lane (just north of Post Hill junction)	4	305	305	0	0%
Post Hill (east of Uplowman Road)	5	966	1663	697	72%
Blundells Road (East)	6	1015	1206	191	19%
Blundells Road (Centre)	7	1024	1265	241	24%
Blundells Road (near School)	8	981	1193	212	22%
Great Western Way	9	2015	2173	158	8%
Heathcoat Way (south)	10	1353	1306	-47	-4%
Heathcoat Way (north)	11	1834	2031	197	11%
A361 (West of Bolham Roundabout)	12	1554	1554	0	0%
A361 (Bolham to Gornhay)	13	2287	2360	73	3%
A361 (Gornhay to new A361 junction)	14	3800	4097	297	8%
A361 (A361 junction to M5)	15	3214	3257	43	1%
A361 eastbound off slip	16	380	559	179	47%
A361 westbound off slip	17	134	189	55	41%
A361 eastbound on slip	18	135	196	61	45%
A361 westbound on slip	19	475	689	214	45%
Post Hill (east of Putson Lane)	20	562	1259	697	124%
Post Hill (east of Hartnoll Park development)	21	554	576	22	4%

7.5.13 It should be noted that the proposed development does not result in a straightforward increase in traffic on all links because the provision of the new junction on to the A361 allows a redistribution of existing traffic to more convenient routes, reducing the impact of the development particularly on Blundell's Road.

7.5.14 By reference to the rule–of-thumb from the IEMA Guidelines set out in paragraph 9.1.9, the assessment should include links where traffic flows are predicted to increase by more than 30%, or more than 10% in sensitive areas. Blundell's Road is considered to be sensitive where it passes through Blundell's School. On

this basis, the links to be included in the assessment are shown in **Table 7.9** which indicates the average of the two peak hour flows on 10 of the highway links that meet this criteria.

Table 7.9: 2026 Predicted Average AM & PM Peak Hour Flows, with and without Development

Link		2026 With EUE	2026 with EUE & Hartnoll Park	Difference	Growth
Description	**Link No**	**PCU**	**PCU**	**PCU**	**%**
A361 Link close to Blundells Road	1	988	1487	499	50%
A361 Link close to A361	2	1082	1580	499	46%
Post Hill (east of Uplowman Road)	5	903	1573	670	74%
Blundells Road (Centre)	7	1005	1217	212	21%
Blundells Road (near School)	8	939	1122	183	20%
A361 eastbound off slip	16	381	561	180	47%
A361 westbound off slip	17	149	215	66	44%
A361 eastbound on slip	18	129	180	51	40%
A361 westbound on slip	19	423	625	202	48%
Post Hill (east of Putson Lane)	20	549	1218	669	122%

7.5.15 It can be seen that 6 of the 10 links include the new link road to the A361 junction and the slip roads within the junction. Checks have been made of the capacity of these links by reference to Advice Note TA 79/99 'Traffic Capacity of Urban Roads' and TD 22/06 'Layout of Grade Separated Junctions' and indicates that the flows are within the capacity of the new road.

7.5.16 The new roads and junctions form an intrinsic part of the development and will be designed to accommodate all road users, including pedestrians and drivers, and to operate safely without causing delay.

7.5.17 The magnitude of any traffic impact on the new roads is therefore expected to be **minor.** The effect will be limited to the local area, and the significance can therefore be regarded as **slight to negligible**.

7.5.18 Of the remaining links listed in **Table 7.9** traffic on Blundell's Road at Blundell's School is predicted to increase by 183 vehicles (20%) in the average peak hour. Traffic on Post Hill will change by the greatest amount with an increase of 670

vehicles (74%) to the east of Uplowman Road. This is a significant increase but is still well within the capacity of the road.

7.5.19 On all other roads the tables indicate that flow increases are at or below 10% with the A361 increasing by 8% in the both peak to the east of the Gornhay Interchange.

7.5.20 The forecast increases in traffic have been reviewed with respect to the IEMA significance criteria and the magnitude of the impact on all traffic-related environmental indicators has been found to be negligible with the exception of Blundell's Road where a minor adverse effect will occur and Post Hill which will have a moderate adverse effect as the increase exceeds 60%. The effect will be limited to the local area, and the significance can therefore be regarded as slight to negligible.

7.5.21 The following sections assess the links in terms of the effects described in section 9.2

Pedestrian/Cyclist amenity and delay

7.5.22 Few quantitative methods of assessing pedestrian and cyclist delay exists. IEMA Guidance for the Environmental Assessment of Road Traffic suggests a range of pedestrian crossing times of 10 seconds (lower threshold) to 40 seconds (higher threshold) which equates to a link with no crossing facilities exhibiting a two-way flow of approximately 1400 vehicles in the peak periods. However, the guidance also recommends that assessments should be based on judgement rather than specific thresholds to determine environmental effects.

7.5.23 Increases in traffic levels as a consequence of a development are likely to lead to a greater degree of delay to pedestrians and cyclists wishing to cross roads. The degree of pedestrian and cycle delay can therefore be correlated with severance. Based on observations and searches with the relevant organisations it is possible to identify the following conditions:

- Levels of connectivity (routes providing a coherent network of links between primary land uses);
- Safety;

- Crossings (controlled and uncontrolled crossings);
- Lighting (presence of Street lighting or light spill);
- Footway and cycleway quality; and
- Barriers (obstructions to desire lines, including topography).

7.5.24 We have considered Blundell's Road and Post Hill in two sections; namely, the section from Manley Lane to the new roundabout connecting with the A361 Link Road and from the new roundabout to Blundell's roundabout. The first section is mostly known as Post Hill with a short section of Blundell's Road to the west of Uplowman Road.

7.5.25 Section 1 of the route is single carriageway measuring approximately 7.3 m in width provided with an adequate footway on at least one side of the road. The section is subject to a 40mph speed limit and is generally level or with a slight gradient and is relatively straight. This road used to act as the main road to Tiverton and is in good condition with a suburban character.

7.5.26 Section 2 of Blundell's Road has a different character with over half of the length within the 30mph zone travelling through Blundell's School. Facilities for the school are fairly evenly spread on both sides of the road and result in considerable volumes of pupils crossing the road between lessons and to the various recreational facilities. The footway continues along the full length of Section 2 on the north side of the road and intermittently on the south side of the road. At the centre of the school a signal controlled crossing is provided where over 3,100 pedestrians were observed crossing Blundell's Road over a 12 hour period.

7.5.27 The width of Blundell's Road through the area of the school is generally 7.3m and narrows to a minimum of 6.1m immediately to the west of the school on the approach to Blundell's roundabout. Just before reaching the roundabout another signal controlled pedestrian crossing is provided where 476 pedestrians were observed crossing in a 12 hour period. To the north west of the crossing a pedestrian footbridge is provided which allows pedestrians to cross Heathcoat Way in complete safety. From the west side of Heathcoat Way adequate footways are provided allowing pedestrians to access the town centre facilities with minimal vehicle conflict.

7.5.28 With the increase in traffic predicted on Blundell's Road quoted in Tables 9.7 to 9.9 together with the existing provision of signal controlled crossing points and future traffic calming it is considered that the magnitude of the traffic increases will have a moderate adverse impact on pedestrian and cycle amenity and delay on this road. On Post Hill there will also be a moderate adverse effect as the increase is over 60%. As the effect will be limited to the local area, the significance can be regarded as slight to negligible.

Driver Delay

7.5.29 As stated in paragraph 9.2.32, delay to drivers are most likely to occur at junctions, and are only expected to be significant where the junction is close to capacity. The assessment has considered delays at 11 junctions and has only found two junctions where improvements may be required.

7.5.30 The junctions that will require modification are the roundabout connecting Blundells Road to the A361 link road and Junction 27 of the M5. The modifications to these junctions include:

- Widening of the eastern and northern approaches at the Blundell Road/A361 link roundabout to form two lane entries, and

- Widening of the A361 and A38 approaches at Junction 27 to form three lane entries together with slight widening of the entry to the on-slips to allow two lanes of traffic.

7.5.31 With the minor improvements described above it is clear that the full EUE development together with the Hartnoll Park development can be accommodated on the surrounding highway network. These improvements would be funded by the development.

7.5.32 No additional delay to drivers of more than 30 to 60 seconds is expected to arise as a result of the development and the magnitude of the effect would be minor adverse or less. As only a small number of junctions will be affected the significance can be regarded as slight to negligible.

Fear and intimidation

7.5.33 The IEMA Guidelines state that the issue is a complex problem which cannot be assessed by quantitative means alone. The definition adopted was set out in para 9.2.38 as follows:

7.5.34 As HGV flows and speed are not considered to be significant factors in the area the following definitions have been used as to determine fear and intimidation:

- Substantial adverse: Average hourly traffic 1,800 or more vehicles
- Moderate adverse: Average hourly traffic 1,200 to 1,800 vehicles
- Minor (slight) adverse: Average hourly traffic 600 to 1,200 vehicles
- Insignificant: Average hourly traffic up to 600 vehicles
- Minor (slight) beneficial: (if degree of hazard reduced by one category)
- Moderate beneficial: (if degree of hazard reduced by two categories)
- Substantial beneficial: (if degree of hazard reduced by three categories)

7.5.35 Based on the traffic flows set out in **Tables 9.7 to 9.9**, the effect on Post Hill, Blundell's Road and the A361 Link Road is **moderate adverse.** As the effect will be limited to the local area, the significance can be regarded as **slight to negligible**.

Public transport

7.5.36 The development proposal will increase the demand for travel by bus and rail. Given the nature of the local bus services, any increase in patronage will provide benefits to the service and increase its viability. This will also enhance the requirement for the bus service. Additionally an increase in rail travellers will increase revenue for rail operators which could enhance the viability of services. In light of the above the development will result in a **long-term minor beneficial** impact on public transport.

Severance

7.5.37 In respect of severance the increase in traffic flows as a result of the proposals are shown in **Tables 9.7 to 9.9** and are well below the levels of increase indicated in the IEMA guidelines where severance impacts are likely to occur. The

guidelines suggest that increases above 30% are significant except in sensitive areas where 10% could be significant.

7.5.38 Severance is the perceived division that can occur within a community when it becomes separated by a major traffic route. In terms of Blundell's Road and Post Hill the community to be affected is limited. However, regardless of the definitions set out above, it is reasonable to suppose that an increase of 20% could be regarded as adverse in a sensitive area such as Blundell's School.

7.5.39 In terms of severance there is therefore considered to be a minor, or **slight adverse** effect on Blundell's Road at Blundell's School and at Post Hill. In each case the effect will be local and the significance of the effect is **slight to negligible.**

Accidents and safety

7.5.40 No pattern of accidents over the past five years has emerged to indicate a road safety concern that may be exacerbated by the proposed development.

7.5.41 The post development character of the area will be changed in traffic terms with traffic calming at Blundell's School, the construction of the roundabout linking to the A361 junction and the proposed low speed 'loop road' through the development. The speed of vehicles will be reduced and it is considered that there will be a **negligible** impact on accidents and safety.

7.6 Proposed Mitigation

Construction

7.6.1 It is proposed that the Construction Environmental Management Plan (CEMP) will be implemented in order to minimise the risk of the likely environmental impacts occurring during the construction phase. It will also aim to effectively reduce the impact associated with construction activities, including the use of defined haulage routes and timing of heavy loads.

7.6.2 The type of vehicle that will transport materials to the site will be determined in advance to ensure a safe and efficient delivery taking into consideration local constraints. Construction traffic movements will be kept to agreed working hours where practicable and designed to minimise disruption on the highway network and local residents (including during the night time). The measures set out in the CEMP will be implemented and monitored in accordance with best practice construction management processes.

Operation

7.6.3 The following mitigation is proposed as part of the development proposal:

Travel Plan to support travel by sustainable modes

7.6.4 A travel plan has been produced for the site to encourage and promote travel by sustainable modes of travel (attached at Technical Appendix 7.2). The travel plan includes a package of measures to promote and enable more sustainable travel patterns. Travel plan measures include appointment of a Travel Plan Coordinator (TCP)m provision of information packs on sustainable travel and the benefits of sustainable travel, travel vouchers and cycle parking to name a few. Further details of the Travel Plan are contained in a separate report.

Pedestrian and cycle facilities

Walking and cycling

7.6.5 As mentioned previously in the immediate vicinity of the site there is currently limited pedestrian and cycle facilities. This deficiency will be improved by the

construction of footways and cycleways through the development and by the provision of reasonable funding towards the DCC planned footway improvements and extension of 30mph speed limit on Post Hill.

7.6.6 On the southern side of Post Hill, the existing footway will be extended from its existing extent to the west of Manley Lane junction along the northern frontage of the site to the site access junction. This footway will be 2m in width throughout. Dropped Kerbs will be provided at Manley Lane to facilitate crossing of this carriageway, whilst an informal crossing facility with tactile paving will be provided on Post Hill to the west of Manley Lane to allow pedestrians to cross the carriageway.

7.6.7 This crossing will provide access to a new proposed bus stop located on the northern side of Post Hill for Eastbound services. A complimentary westbound bus stop will be provided immediately adjacent to the northern site boundary which will also be accessible via the new footway facility. In addition, given increased pedestrian / cycle movements in the vicinity, the extension of streetlighting along Post Hill to the proposed site access can be explored with DCC at the detailed design / s278 stage.

7.6.8 As a result of the proposed improvements described above, pedestrians and cyclists will be able to access the site via several routes. A pedestrian / cycle connection will be provided in the north western corner of the site, along the desire line to travel to the town, immediately south of the proposed westbound bus stop and connecting to the internal footways. This will ensure pedestrians can easily travel to and from the site to both the footway for local destinations, or to access the bus stops. Alternatively, pedestrians will be able to access and egress the northern boundary of the site via the vehicle access junction.

7.6.9 Further, additional pedestrian / cycle links could potentially be provided on the western boundary of the site, connecting to Manley Lane. In the period before the EUE is fully developed, these access points will facilitate north / south pedestrian and cycle movements. Pedestrians may choose to use the leisure route that uses the canal path for much of its length, connecting Manley Lane to Tiverton town centre. Cyclists could therefore use the links to Manley Lane to

travel to and from Tiverton via National Cycle Route 3 that connects to Manley Lane to the south, avoiding Post Hill and Blundells Road.

7.6.10 The pedestrian and cycle access points on Manley Lane could also provide connections to the eastern parcel of the EUE, facilitating east / west movements from the site. Future residents and employees of the site could therefore potentially be able to gain direct access to the EUE, including the facilities that will be delivered as part of the development. The proposed access strategy could therefore provide seamless connections to the EUE in the future.

Public transport

7.6.11 As described above, new bus stops will be delivered as part of the development access strategy. The stops are served by frequent services providing connections to Tiverton, Taunton and Tiverton Parkway as well as other local destinations.

7.7 Residual impact

Construction

7.7.1 This Chapter has demonstrated that the construction of the proposed development will have a **negligible** impact.

7.7.2 A CEMP is proposed which will further minimise the impact of the construction phase.

Operation

Pedestrian and cycle amenity

7.7.3 This Chapter has reported that the development proposal will have a **moderate adverse** impact on pedestrian and cycle amenity along Blundell's Road and Post Hill, without the implementation of mitigation measures. Measures to improve the pedestrian amenity are proposed in terms of traffic calming on Blundell's Road and Post Hill and an extension of the 30mph limit.

7.7.4 Additionally a travel plan will be developed for the site which will seek to reduce vehicular movements associated with the site.

7.7.5 In light of the above it is considered that the residual impact of the development proposal on pedestrian and cycle amenity will be **negligible**.

Fear and intimidation

7.7.6 The mitigation package proposed as part of the development proposal will improve the pedestrian amenity, especially at Blundell's School and on Post Hill. Although traffic flows will increase as a result of the proposed development it is considered that the package of measures proposed will assist in reducing the impact of the development on fear and intimidation.

7.7.7 In light of the above it is considered on balance that the residual impact of the development on fear and intimidation is **negligible**.

Public transport

7.7.8 The proposed development will increase the demand for travel by public transport. Additionally, a travel plan will be developed to encourage travel by sustainable modes including public transport. Given the nature of the local bus services, any increase in patronage will provide benefits to the service and will increase their viability. Additionally an increase in rail travellers will increase revenue for the rail operators which could enhance the viability of services.

7.7.9 In light of the above the development will result in a **minor positive impact** on public transport services.

Severance

7.7.10 The residual impact of the development proposal on severance levels along Blundell's Road and Post Hill is considered **negligible**, subject to the proposed traffic calming mitigation being constructed.

Driver delay

7.7.11 Quantitative assessment of driver delay has been determined from the junction capacity tests. With slight improvements to two junctions all eleven junctions will operate within capacity with minimal additional delay resulting from the development. A travel plan will be developed for the site to reduce the number of car trips associated with the site.

7.7.12 Notwithstanding the above the development will result in additional vehicles on the highway network. It is concluded that the impact of the development on driver delay will remain **negligible**.

Road safety

7.7.13 Even with the presence of development traffic on the adjacent highway network, traffic flows along Blundell's Road will only increase by 20%. A package of traffic calming measures is proposed which will improve road safety along Blundell's Road adjacent to the school and on Post Hill.

7.7.14 In light of the above it is considered that there will be a **negligible** impact on road safety.

7.8 Cumulative and interactive effects

7.8.1 We are not aware of other schemes which need to be considered as part of this assessment.

7.8.2 It is considered that the traffic associated with the proposed development will have a socio economic impact on Tiverton. Chapter 4 includes a detailed assessment of the socio-economic impact of the development proposals. It is considered that the increase in vehicular traffic is likely to have an impact on the amenity of users along Post Hill and Blundell's Road.

7.8.3 The pedestrian and cycle amenity has been considered within this Chapter which concludes that the impact of the development on the pedestrian and cycle amenity will be negligible.

7.8.4 The mitigation measures proposed as part of the development proposal could have an impact on the landscape and visual appearance of Post Hill and Blundell's Road. Chapter 8 includes a detailed assessment of the impact of the development proposals on the landscape and visual appearance.

7.9 Residual impact

Summary

7.9.1 This Chapter of the ES demonstrates that the residual impacts of the development on transport are considered negligible. Any adverse impacts arising from the development have been adequately addressed by a suitable package of mitigation measures.

7.9.2 Given the levels of background traffic and the level of increase forecast as part of the development, a **negligible impact** is considered reasonable.

7.9.3 **Table 7.10** contains a summary of the likely significant effects of the proposed development.

Table 7.10 Summary of Transport and Accessibility Effects

Potential effect	Nature of effect (permanent/temporary)	Significance (major/moderate/minor) (beneficial/adverse/negligible)	Mitigation/enhancement measures	Geographical importance	Residual effects (major/moderate/minor) (beneficial/adverse/negligible)
Construction					
Pedestrian amenity	Temporary	Slight Adverse to Negligible	Construction environmental management plan(CEMP) to be produced	Medium	Negligible
Cycle amenity					
Fear and intimidation					
Public transport					
Severance					
Driver delay					
Road safety					
Operational					
Pedestrian amenity	Permanent	Moderate adverse	Improvements to the pedestrian and cycle amenity on Post Hill and Blundell's Road corridors Travel plan to promote travel by sustainable modes	Low	Negligible
Cycle amenity		Moderate adverse			Negligible
Fear and intimidation		Moderate adverse			Negligible
Public transport		Minor beneficial			Minor beneficial
Severance		Slight adverse			Negligible
Driver delay		Slight adverse			Negligible
Road safety		Negligible			Negligible

8 Flood Risk and Drainage

8.1 Introduction

8.1.1 This chapter of the Environmental Statement (ES) contains an assessment of the likely significant effects that the Proposed Development would have on the water environment and, where necessary, identifies mitigation measures in accordance with relevant legislation, policies and statutory requirements in respect of hydrology, flood risk and drainage.

8.2 Legislative and Policy Framework

8.2.1 Legislation and planning policy relevant to this assessment includes:

- Water Framework Directive [2000/60/EC];
- Groundwater Directive [2006/118/EC];
- Floods Directive [2007/60/EC];
- Flood and Water Management Act 2010;
- Environmental Act 1995;
- Water Resources Act 1991;
- Land Drainage Act 1991;
- National Planning Policy Framework;
- Planning Practice Guidance;
- The Mid Devon Local Plan.

8.2.2 A number of standards and guidelines, which provide details of assessment methodologies and mitigation techniques were used in completing this assessment. These include:

- Environment Agency Pollution Prevention Guidelines (Numbers 1, 3, 5, 6 and 8);
- EA Report SC030219 – Rainfall Runoff Management for Developments;

- Control of Water Pollution from Construction Sites: Guidance for Consultants and Contractors (CIRIA C532, 2001);
- Environmental Good Practice On Site Guide (3rd Ed.) (CIRIA C692, 2010);
- Control of Water Pollution from Linear Construction Projects (CIRIA C648, 2006);
- The SuDS Manual (CIRIA C697, 2007);
- Designing for Exceedance (CIRA C635, 2006); and
- Interim Code of Practice for SuDS (National SuDS Working Group, 2004).

8.3 Methodology and Scope

8.3.1 This chapter includes an assessment of potential pollution impacts and an assessment of flood risk which complements a Flood Risk Assessment (FRA) document, containing an outline surface water drainage strategy. The FRA is contained in **Volume 3 Technical Appendix 8.1** of this ES.

8.3.2 The effect of the Proposed Development is considered in the context of the surrounding environment due to the inherent linkages with the hydrological system, specifically the upstream and downstream reaches of the Alsa Brook and the Tidcombe Lane Fen Site of Special Scientific Interest (SSSI).

8.3.3 A desk study and site walkover have been undertaken to establish the baseline hydrology (surface water), hydrogeology (groundwater), flood risk, and environmental quality of the Assessment Site and its immediate vicinity.

8.3.4 The following sources of information have been reviewed to establish the baseline conditions:

- Framework Plan (Appendix 2.1);
- Ordnance Survey 1:25,000 scale Maps;
- Lidar height data;

- Environment Agency website and online mapping (January 2015);
- British Geological Survey [2015] NERC online mapping;
- Mid Devon District Council Level 1 and 2 Strategic Flood Risk Assessment (SFRA) (June 2009);
- Devon County Council Surface Water Management Plan Phase 1 – Strategic Assessment (SWMP) (July 2012);

8.3.5 To assess the significance of the effects of the Proposed Development on the water environment a set of threshold criteria have been established based on the interaction between the value and sensitivity of the receptor and the magnitude of change. The criteria to assess the value/sensitivity of the receptor are set out in **Table 8.1** and the criteria to assess the magnitude of the effect is set out in **Table 8.2**.

Table 8.1 Assessment of the Value and/or Sensitivity of a Receptor

Value/ Sensitivity	Receptor
Very High	Internationally Designated Area: e.g. Special Area of Conservation (SAC), Special Protection Area (SPA), Ramsar site.
	Internationally protected species.
	Local residents (persons and property).
High	Nationally designated area: e.g. Site of Special Scientific Interest (SSSI), National Nature Reserve, Groundwater Source Protection Zone or Principal Aquifer.
	Nationally protected species.
	Functional floodplain or flood storage area.
	Watercourse, waterbody or wetland with 'Excellent' or 'Good' quality.
Medium	Non statutory sites of regional or local importance e.g. Local Nature Reserve (LNR).
	Watercourse, waterbody or wetland with 'Good' or 'Satisfactory' quality.
	Secondary Aquifer.
Low	Flood Zone 1 - low probability of flooding.
	Heavily Modified Waterbody and a Watercourse or waterbody or wetland with 'Poor' quality.

Table 8.2 Assessment of the Magnitude of the Effect

Magnitude	Criteria
Substantial Adverse	Significant permanent deterioration of water quality, habitat quality or flow characteristics of a watercourse or groundwater body.
	Significant loss of floodplain storage.
	Increase whole catchment risk of flooding.
Moderate Adverse	Increase in flood risk affecting the Assessment Site and its immediate vicinity.
	Moderate changes to the habitat quality or flow characteristics of a watercourse.
	Severe temporary reduction in the quality of surface water resources.
Slight Adverse	Minor increase in flood risk to the Assessment Site.
	Minor changes to habitat quality or flow characteristics of a watercourse.
	Minor local scale reduction in the quality of surface water resources, reversible with time.
Negligible	No appreciable impact on surface water drainage regime, water quality or existing flood risk.
Slight Beneficial	Reduction in flood risk for the Assessment Site and its immediate surrounds.
	Minor local scale improvement to the quality of surface water resources.
Moderate Beneficial	Reduction in local sub–catchment flood risk.
	Moderate local scale improvement to the quality of surface water resources.
Substantial Beneficial	Reduction in whole catchment flood risk.
	Significant local scale, or moderate to significant regional scale, improvement of the quality of surface water resources.

8.3.6 The likely significant environmental effects are rated on a seven point scale (major beneficial, intermediate beneficial, minor beneficial, neutral, minor adverse, intermediate adverse and major adverse). The scale is derived from the interaction of receptor sensitivity and magnitude of the effect, as detailed in Table 8.3 below. The effects are judged to be adverse or beneficial, and temporary or permanent.

Table 8.3: Significance of Impacts Matrix

Sensitivity of Receptor	Magnitude of Impact			
	Substantial Impact	Moderate Impact	Slight Impact	Negligible Impact
Very High	Major	Major - Intermediate	Intermediate	Minor
High	Major - Intermediate	Intermediate	Intermediate - Minor	Minor – Neutral
Medium	Intermediate	Intermediate - Minor	Minor	Neutral
Low	Intermediate - Minor	Minor	Minor – Neutral	Neutral

8.3.7 The threshold criteria for assessing the significance of the proposed mitigation measures on the effects of the Proposed Development on the Application Site's hydrology, flood risk and drainage have been determined based on planning policy and legislation; industry best practice; and professional judgment.

8.3.8 The assessment of the significance of the effects of the Proposed Development on the Water Environment is based on the assumption that the baseline data is correct.

8.4 Baseline Conditions

Site Description and Hydrological Context

8.4.1 An overview of Ordnance Survey and Lidar mapping of the area identifies that the site lies within the catchment area of the Alsa Brook and drains west into the Tidcombe Lane Fen SSSI.

8.4.2 There are ditches crossing the site mainly adjacent to field boundaries consisting of raised "Devon Hedgebank" features. A single pond is located on the western side of the site.

8.4.3 The land is presently in agricultural use, primarily pasture land at present, with occasional arable land use.

8.4.4 The geology of the Assessment Site is sandy silty clay with some gravel elements over Tidcombe Sandstone, a sedimentary bedrock.

8.4.5 From an inspection of the Environment Agency's Aquifer Designation Map on its website both the site's bedrock and superficial geology are classified as a Minor Aquifer of high vulnerability. This is defined by the Environment Agency "as permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers". The Assessment Site does not lie within a Groundwater Source Protection Zone.

8.4.6 The Tidcombe Lane Fen SSSI is located west of the proposed development in the shallow valley surrounding the Alsa Brook. The SSSI contains a type of wetland habitat that is now nationally scarce and rare in Devon. The habitat is sensitive to changes in its hydrological catchment and is dependent on a continuous water supply, high water table, occasional flooding and good water quality.

8.4.7 There are existing foul sewers in Post Hill serving the existing built development in that area. There are no public sewers recorded on the SWW maps serving the existing Hartnoll Farm complex.

Flood Risk

8.4.8 A number of existing flood hazards affect the Assessment Site and its immediate vicinity. The FRA provides a more detailed assessment of these hazards and this information is summarised in Table 8.4 below:

Table 8.4: Pre-development Potential Flood Risk from All Sources of Flooding

Flood Source	Potential Risk				Description
	None	Low	Medium	High	
Watercourses		X			All built development is restricted to land which is assessed as having a less than 1 in 1000 annual probability of river flooding (Flood Zone 1). One proposed detention basin in the west of the site extends into Flood Zone 2 of the Alsa Brook.
Surface Water			X		The topography of the land indicates that any overland flow would be directed towards low points located along field boundaries and hedge banks. EA Flood Risk Maps for Surface Water show the risk areas are located along the ditches and hedge banks in the site. The ditches eventually become the Alsa Brook on the western boundary of the site.
Groundwater			X		The SFRA does not identify any groundwater flooding affecting the site. However, the underlying geology suggests shallow groundwater may be present and further investigation is needed. In the absence of a detailed study the risk is considered medium.
Overwhelmed Sewers		X			There is an existing off-site sewer network near the site. The SFRA does not identify any incident of sewer flooding affecting the site and no public sewers are recorded as crossing the development site.
Artificial Sources (Reservoirs, canals and lakes)			X		The site is not affected by reservoir flooding. A breach event of the Grand Western Canal is considered a flood hazard. If this occurred the zone immediately adjacent to the canal would be inundated. As breach flows travelled west or north they would flow with the topography to the natural valley features mapped as surface water flood risk areas. It is therefore important that these areas are not developed but are left as sterile strips except where culverts are required to carry road links over the watercourse.

Environmental Quality

8.4.9 The Environment Agency's online mapping has been consulted. Based on this search the catchment is presently at risk of nitrate pollution from agriculture; sediment losses; faecal indicator organisms; and diffuse

pollution. Furthermore, the site lies within a Surface Water Safeguard Zone in which potable water resources are at risk from pesticides.

8.4.10 The Environment Agency considers the underlying groundwater water to be Good Quantitative status but Poor Deteriorating Chemical Quality.

8.4.11 A summary of the receptors and an assessment of their value is outlined in in Table 8.5 below.

Table 8.5 Receptors and Sensitivity

Sensitivity	Receptor
Very high	Residents downstream of the proposed development.
High	Alsa Brook and Tidcombe Lane Fen SSSI.
Medium	Minor Aquifer High Vulnerability.
Low	Existing Foul Water Network, and drainage ditches.

8.5 Identification and Evaluation of Key Likely Impacts

Construction Phase

8.5.1 During the construction phase there is the potential for on-going disruption to the Assessment Site's drainage regime prior to the completion of the surface water drainage system. There is a potential risk of ponding on the Assessment Site as a result of the runoff from the increased impermeable area draining from the site; the disruption of existing overland flow routes; and potential soil compaction as a result of construction activities. The potential significance of the effect of the construction of the proposed development on surface water runoff and the water levels in the receiving water bodies without mitigation is considered to be '**Major adverse'** to **'Intermediate Adverse'**.

8.5.2 There are a number of substances which could potentially adversely affect surface water quality on the Assessment Site and its immediate vicinity as a result of construction activities. Potentially polluting construction activities include excavation; vehicle operation; machine and plant washing; erosion from temporary vehicle routes and exposed earth;

incorrect storage of substances; and accidental spillages and incidents. Polluting substances could include:

- Fine sediment (e.g. silts and clays);
- Cementitous materials;
- Oil, fuels and chemicals, including lubricants, coolants and hydraulic fluids; and
- Other general wastes including wood, plastics, sewerage and construction aggregate.

8.5.3 These substances could potentially contaminate downstream watercourses via surface runoff or sub-surface flow, especially after periods of rainfall. The potential significance of the contaminate effects is dependent on the nature and scale of pollution event, the nature of the pollutant, and antecedent conditions. The effects of potential pollution incidents on water resources without mitigation can range from 'Minor Adverse' to 'Major - Intermediate Adverse'.

Operational Phase

8.5.4 The FRA recognises that all built development is restricted to Flood Zone 1 and is protected from fluvial flooding by the site's topography. One detention basin/ pond extends into Flood Zone 2 in the western area of the site.

8.5.5 The FRA also recognises the importance of the surface water flood risk areas and conveyance routes for discharges from the canal. These areas will not be developed.

8.5.6 The proposed development will disrupt the existing surface water drainage regime and increase the extent of impermeable area, leading to a potential increase in the volume and rate of surface water runoff discharged to the receiving watercourse (including the Tidcombe Lane Fen SSSI). Unless mitigation measures are put in place there will be an increased risk of flooding both onsite and offsite and the flow characteristics of the

downstream watercourse will be severely altered. Without mitigation the significance of the effect of the Proposed Development on increasing flood risk and local hydrological characteristics is considered to be 'Major Adverse'.

8.5.7 Following the completion of the Proposed Development there is potential for polluting substances to have a detrimental effect on the water quality of the surface water runoff and consequently the receiving water body. These substances include:

- Hydrocarbons from increased vehicular movement and leakages;
- Heavy metals, primarily Zinc, Iron, Lead, Cadmium and Copper originating from fuel combustion emissions and wear down of brakes and tyres;
- Sediment introduced to the Assessment Site from vehicle movement;
- Oil and chemicals (from heating systems/ storage areas); and
- Detergents and household chemicals.

8.5.8 These substances may be present as a result of normal operation of the development, such as increased vehicle usage, or through accidental spillage. The nature of the proposed development suggests that it is unlikely that large quantities of highly polluting substances will be present on site and highly polluting activities are unlikely to be undertaken. The significance of any pollution incident will be dependent upon the nature of the pollutant, the nature of the incident, the sensitivity of receiving environment, and the effectiveness of mitigation measures. The significance of the adverse effects on surface water quality without mitigation could range from 'Minor Adverse' to 'Major-Intermediate Adverse'.

8.5.9 Whilst organic matter, nutrients, fertilisers, pesticides, and herbicides may be used in the management of proposed landscaped areas, it is anticipated that the cessation of agriculture will reduce the overall quantity of agrochemicals being applied and/or organic matter generated by livestock

within the Application Site compared with the baseline condition. The potential for agrochemicals and animal waste contaminating surface runoff and groundwater will therefore be reduced. The significance of the effect of the cessation of farming activities on the Assessment Site and the management of landscape activities on water quality is considered 'Minor Beneficial' to 'Neutral'.

8.5.10 South West Water has identified that the existing foul network in the area has little capacity for this development and a study will be required to determine the improvements required to serve any development at this location. Detailed investigations will be required to ascertain the scope and magnitude of offsite upgrading works. Without upgrading works the effect of the full development on the sewer network would be 'Intermediate-Minor Adverse'.

8.5.11 A summary of the unmitigated impact of the development and an assessment of the significance is outlined in Table 11.6 below.

Table 8.6 Likely Unmitigated Impacts

Impact	Sensitivity of Receptor	Direct / Indirect	Positive / Negative	Impact Magnitude	Significance of Impact
Construction					
Increased flood risk as a result of increased impermeable areas	Very High	Direct	Negative	Slight to substantial	Intermediate to Major adverse
Potential pollution incidences involving local water bodies	High / Medium	Direct	Negative	Slight to substantial	Minor to Major-Intermediate adverse
Impact on Tidcombe Lane Fen SSSI - Change in hydrological characteristics water quality, rate and volume	High	Direct	Negative	Substantial	Major adverse
Operational					
Increased flood risk as a result of increased impermeable areas	Very High	Direct	Negative	Substantial	Major adverse
Potential pollution incidences involving local water bodies	High / Medium	Direct	Negative	Slight to substantial	Minor to Major-Intermediate adverse
Impact on Tidcombe Lane Fen SSSI - Change in hydrological	High	Direct	Negative	Substantial	Major adverse

characteristics water quality, rate and volume					
Reduction in pollution incidences related to removal of farming	Medium	Direct	Positive	Slight	Neutral to minor beneficial
Increase in foul flow to the foul network	Low	Direct	Negative	Substantial	Intermediate-minor adverse

8.6 Mitigation Measures

Construction Phase

8.6.1 Management Control Mitigation is proposed during the construction phase. Management Control measures will include proper supervision of construction activities at all stages of the project using appropriately experienced and qualified staff and supervisors, and strict adherence to Health and Safety Regulations, Codes of Practice, and any consent Conditions as stipulated by the Environment Agency, Natural England and Mid Devon District Council.

8.6.2 Contractors will employ best practice and adopt the principles set out in the Environment Agency's Pollution Prevention Guidelines (Numbers 1, 3, 5, 6 and 8), CIRIA C532, CIRIA C692, and CIRIA C648.

8.6.3 Works near watercourse will be minimised and no material or plant will be stored within the floodplain. The floodplain downstream of the site associated with the Ailsa Brook is in a flood alert area. The Principal Contractor will engage with the Devon County Council Great Western Canal team which can provide an early warning forecast of potential flooding from a canal release. If flooding is forecast then construction will cease in the surface water flood risk areas if culvert works are underway until the risk drops to an acceptable level.

8.6.4 Additional precautions will be taken in any areas where there is increased risk of hydrocarbon/chemical spillage and hazardous substance storage. Any relevant materials will be stored in accordance with the appropriate Pollution Prevention Guidelines with an impermeable base and suitable

bunding to prevent discharge in the event of spillage and leakage, and the design and location will be in accordance with the Environment Agency's requirements.

8.6.5 Temporary drainage facilities will be installed to ensure containment of surface runoff and the controlled discharge into the receiving drainage ditches until the permanent drainage measures are completed. These temporary measures will include decontamination facilities, where appropriate, prior to discharge and will ensure that the risk of water pollution incidents is minimised. The construction of the drainage system will be phased to ensure sufficient storage volume is available throughout the lifetime of the development to maintain surface water runoff compared with the pre development rate. These measures will prevent uncontrolled overland flows running off the construction site and the ponding of surface water within the Application Site, and ensure that the risk of onsite and offsite flooding is not increased.

8.6.6 Effective contingency plans will be put in place to manage the risk associated with accidents and/or unforeseen circumstances. For example, the use and location of accidental spill kits will be relayed to the construction personnel. An emergency response plan could be developed in consultation with the Environment Agency in the event of a pollution incident. The plan would include the need for staff training in emergency procedures and the provision of appropriate emergency response equipment.

8.6.7 Suitable temporary road surfaces will be used to prevent erosion and mobilisation of sediment. The contractor will provide additional street cleaning facilities as necessary to keep supporting highways clear of mud and prevent sediment contaminating surface runoff. Wheel cleaning facilities, appropriate stockpiling of topsoil, suitable timing of earthwork and earthmoving operations, and dust suppression measures will be used where necessary to prevent migration of sediment and other potentially polluting substances.

8.6.8 Details of environmental monitoring protocols and method statements will be outlined in a Construction Environmental Management Plan (CEMP).

Operational Phase

8.6.9 Surface water runoff from the Proposed Development will be intercepted by on-site drainage systems designed to contain the runoff from storms and discharge at rates that are as close as possible to the existing flow regime through all storms between the 1:2 (QMED) return period storm and up to the 1:100 year return period storm, including an appropriate allowance for climate change. This method ensures that rainwater will feed the Ailsa Brook and Tidcombe Lane Fen SSSI at Greenfield rates without adverse impact on the Ailsa Brook watercourse system.

8.6.10 The development drainage arrangements will incorporate SuDS features including swales, detention basins, and ponds. The surface water system will be designed to incorporate measures designed to trap and intercept any potentially contaminating materials which could spill or leak in higher risk areas, such as car parks associated with employment use. Runoff from roads and carparks will pass through deep trapped gullies (BS5911 (Part 2) or equivalent) prior to discharge to the onsite drainage systems, to reduce the risk of contamination. All larger parking areas should drain via pervious paving or pass through Separators before discharging into the downstream drainage system in accordance with the Environment Agency's Pollution Prevention Guidelines (PPG3).

8.6.11 The number of SuDS features within the drainage system is based on the concept of the treatment train as outlined in Section 3.3.3 and Table 3.3 in the SuDS Manual and will ensure that flood risk elsewhere is not increased. Discharging surface water through the correct number of SuDS features, which include reed beds before being discharged into the watercourse/ drainage ditch, will also assist in controlling pollution, and provide a degree of water treatment contributing towards an enhancement of the overall water quality. Details of the outline drainage strategy are contained in the supporting FRA, contained in Volume 3 Technical Appendix 8.1.

8.6.12 The design of the Proposed Development would intercept any uncontrolled overland flow in extreme events and direct it into the proposed drainage system. Events in exceedance of the design standard of the drainage system will be managed to minimise the residual risk and exceedance flows will be directed away from properties.

8.6.13 The onsite drainage systems would be designed in accordance with the relevant national standards and guidance including the Building Regulations Part H, BS EN 752:2008, and Sewers for Adoption together with Environment Agency documents such as Rainfall Runoff Management for Developments, and the Interim Code of Practice for Sustainable Drainage Systems and informed by a detailed ground investigation.

8.6.14 The proposed development incorporates a green development buffer along the Ailsa Brook and its tributaries. The design and layout of the Proposed Development ensures that the overall direct disturbance from construction activity to the watercourse is minimised and the likely significance of the disturbance to the river corridor ranges from 'Neutral' to 'Minor Adverse'.

8.6.15 Design mitigation will minimise the need to bring potential contaminants onto the Application Site. For example, the Proposed Development will be designed to minimise the need for heating oil storage on the Application Site through the provision of gas, and electric for all buildings. Vehicle routes will be designed such that the risk of incidents or accidents occurring is minimised and, in the event that incidents or accidents still occur, the design will ensure that spillages are not able to migrate large distances.

8.6.16 Effects on water quality from the application of fertiliser, pesticides or herbicides in the landscape areas will be mitigated by the adoption of good management practice such as the provision of untreated buffer strips, and not applying chemicals before periods of heavy rain. These measures will be set out in an appropriate Environmental Management Plan which will be secured by an appropriate condition.

8.6.17 Proper management and maintenance of the surface water drainage system will reduce the risk of blockages or system failures. The maintenance responsibilities will fall to the adopting authority or a Management Company.

8.7 Residual Impacts

Construction Phase

8.7.1 Installing temporary onsite surface water drainage facilities and the construction of the permanent drainage system in the first phase of the development will reduce the residual effect of disruption to the onsite surface water drainage regime as a result of construction activities to between '**Neutral**' and '**Minor Beneficial**'.

8.7.2 Adopting best practice construction site management with adequate contingency planning, and following the principles of pollution prevention guidance will reduce the risk of water pollution. The residual effect on water quality as a result of construction activities is considered to be between 'Minor Adverse' and 'Neutral'. It should be considered that this is dependent on the severity and nature of the pollution incident and that the risk of pollution can never be reduced to none.

Operational Phase

8.7.3 The proposed drainage measures will ensure that there is little or no residual risk of property flooding well in excess of the minimum acceptable standard of protection for new property, which requires that no flooding of property should occur as a result of a 1 in 100 year storm event, including an appropriate allowance for climate change. The proposed surface water drainage systems will intercept overland flows which already runoff and inundate West Manley Lane to the west. The systems will also attenuate flows to the Greenfield rates with controlled flow into the Ailsa Brook. The effect of the proposed development on flood risk to the Assessment Site and its immediate surrounds is considered to be 'Negligible to Minor

Beneficial' and will reduce the uncontrolled field runoff that currently enters West Manley Lane.

8.7.4 The SuDS features, design mitigation and pollution prevention measures incorporated into the onsite surface water drainage systems will reduce the residual effect of surface water or groundwater contamination to between 'Neutral' and 'Minor Adverse'. It should be considered that this is dependent on the severity and nature of the pollution incident and that the risk of pollution can never be reduced to none.

8.7.5 Change of site usage and good management practice of landscaped areas will minimise the effect of agrochemicals on water quality to 'Neutral'.

8.7.6 The proposed above ground SuDS features (basins/ ponds) have potential to have an ecological, aesthetic and amenity benefit. The provision of basins and ponds creates additional wetland habitat and creates diversity within the landscape and safeguards areas of green infrastructure within the proposed development. The residual effects of above ground SuDS features on diversity of habitat, aesthetic and amenity value of the development is considered to be 'Minor Beneficial' to 'Intermediate Beneficial'.

8.7.7 The provision of the SuDS based surface water drainage strategy in which infiltration and attenuation to Greenfield rates is provided should reduce the impact of the proposed development on the flow characteristics of the Tidcombe Lane Fen SSSI. The provision of a number of different SuDS features in a 'treatment train' depending on the source of the surface water will provide an adequate degree of water quality treatment in line within the guidance in The SuDS Manual. These measures minimise the impact to the water quality and the flow characteristics of downstream watercourses and the Tidcombe Lane Fen SSSI and the overall impact on these features is considered to be 'Neutral'.

Table 8.7 Flood Risk and Drainage Impacts

Impact	Mitigation	Impact Magnitude	Significance of Impact
Construction			
Increased flood risk as a result of increased impermeable areas	Installation of temporary onsite surface water drainage facilities	Slight Beneficial	Intermediate Beneficial
Potential pollution incidences involving local water bodies	CEMP – Managagement Control Mitigation - Emergency response procedures and SuDS Management Train.	Negligible	Neutral to minor adverse
Impact on Tidcombe Lane Fen SSSI - Change in hydrological characteristics water quality, rate and volume	Installation of temporary onsite surface water drainage facilities	Negligible	Neutral
Operational			
Increased flood risk as a result of increased impermeable areas	Surface water drainage strategy including the implementation of SuDS which controls discharge at greenfield rates.	Substantial	Major adverse
Potential pollution incidences involving local water bodies	Emergency response procedures and SuDS Management Train.	Negligible	Neutral to Minor-neutral adverse
Impact on Tidcombe Lane Fen SSSI - Change in hydrological characteristics water quality, rate and volume	Surface water drainage strategy including the implementation of SuDS which controls discharge at greenfield rates.	Negligible	Neutral
Reduction in pollution incidences related to removal of farming	None.	Slight	Neutral to minor beneficial
Increase in foul flow to the foul network	Further investigation of capacity and offsite upgrading works were necessary.	Negligible	Neutral

8.8 Cumulative Effects

8.8.1 Government Planning Policy ensures that the significance of the residual effects of new development on surface water and flood risk is minimised following the application of suitably designed surface water drainage systems and application of SuDS principles. Thus, the cumulative effects of several developments in an area should have between 'Negligible' to 'Minor Beneficial' effect on surface water, local flood risk and water quality provided government planning policy, industry best practice and Environment Agency Guidance are complied with.

8.8.2 The upgrade of the sewer network to support new development is a necessary requirement of the planning process. Therefore, once offsite reinforcement is designed and implemented in line with the development phasing the effect of the allocation on the sewer network would be 'Neutral'. The environmental impact of this reinforcement work will have to be assessed when the scope of the works has been finalised.

8.9 Summary

8.9.1 This chapter demonstrates that the residual impacts of the proposed development on Hartnoll Farm land in respect of hydrology, flood risk and drainage will be 'Intermediate – Minor Beneficial'. Any more significant adverse effects have been addressed through the development masterplan provision of a SuDS scheme which incorporates a treatment train discharging at Greenfield rate into the local ditch system and watercourses. This reduces flood risk downstream of the development and safeguards quality of water discharging into the Tidcombe Lane Fen SSSI.

Table 8.4: Summary of Impacts

Impact	Impact Significance	Direct/ Indirect	Positive/ Negative	Temporary/ Permanent	Summary of Mitigation/ Enhancement	Residual Impact magnitude	Residual Impact significance	Positive/ Negative	Temporary/ Permanent	Confidence level
Construction										
Increased flood risk as a result of increased impermeable areas										
Potential pollution incidences involving local water bodies										
Impact on Tidcombe Lane Fen SSSI - Change in hydrological characteristics water quality, rate and volume										
Operational										
Increased flood risk as a										

result of increased impermeable areas										
Potential pollution incidences involving local water bodies										
Impact on Tidcombe Lane Fen SSSI - Change in hydrological characteristics water quality, rate and volume										
Reduction in pollution incidences related to removal of farming										
Increase in foul flow to the foul network										

9. Air Quality and Dust Overview

9.1.1 Kairus Ltd was commissioned by Waddeton Park Ltd to carry out an air quality assessment for the proposed development of land adjacent to the Hartnoll Business Centre (HBC) (the 'Site') to provide a mixed-use development comprising commercial use as an extension to the existing business park and residential development to the west and north. An outline application for the development was submitted to Mid Devon District Council in August 2021 (Application 21/01576/MOUT).

9.1.2 In response to the application the Environmental health Department gave the following response on 3rd September 2021:

> *an application for mixed commercial and residential use adjacent to a large expansion area and close to the main link road will require an air quality report and this is not submitted with this outline application. Again this is an important consideration not mentioned in the documents submitted. Ideally this should be required before determination as may influence the deliverability of the scheme.*

9.1.3 Due to exceedances of the national air quality objectives for nitrogen dioxide (NO2) Mid Devon District Council (MDDC) has declared a number of Air Quality Management Areas (AQMAs) within the district. None of these are located in Tiverton and currently air quality within the town and surrounding area is meeting the relevant air quality objective limits. However, in accordance with the Mid Devon Local Plan1 Policy DM3, any development proposals that are expected to give rise to a significant increase in vehicle movements must be accompanied by a Traffic Pollution Assessment and Low Emission Assessment.

9.1.4 This report addresses the impact of the proposed development on local air quality in the vicinity of the Site. Potential sources of emissions are identified and assessed in the context of existing air quality and emission sources and the nature and location of receptors.

A glossary of common air quality terminology is provided in Appendix A.

9.2 Scope of Assessment

9.2.1 The application is for outline planning permission for up to 150 dwellings and 3.9 ha of employment land resulting in additional vehicle movements on the adjacent road network, therefore an assessment of the impact of traffic generated pollution emissions by the proposals has been undertaken (Traffic Pollution Assessment). The assessment has concentrated on nitrogen dioxide (NO2) and particulate matter with an aerodynamic diameter of less than 10 µm and 2.5µm (PM10 /PM2.5)), the pollutants most associated with traffic emissions and which can be harmful and cause discomfort to humans.

9.2.2 An assessment of air quality impacts associated with the construction of the proposed development has also been undertaken.

9.2.3 The application is for outline planning, therefore full details of the development proposals and mitigation measures have not been determined at this stage. It has not therefore been possible to undertake a full Low Emissions Assessment. However, the residual emissions generated by the development traffic without mitigation and taking into account trip reductions associated with the anticipated Travel Plan have been carried out. The data has been used to undertake a damage cost calculation to determine the impact of the proposals in financial terms.

9.2.4 The scope of the assessment has been discussed and agreed with Janet Wallace, Contract Environmental Protection Officer, MDDC.

9.3 Methodology

Construction Impact Assessment

Construction Traffic

9.3.1 During construction of the proposed development, lorries will require access to the Site to deliver and remove materials; earthmoving plant and other mobile machinery may also work on site including generators and cranes. These machines produce exhaust emissions; of particular concern are emissions of NO_2 and PM_{10}.

9.3.2 Based on the development proposals it is anticipated that there would be no more than 25-30 additional Heavy-Duty Vehicles (HDV) generated on the adjacent road network on any given day.

9.3.3 The IAQM air quality planning guidance sets out criteria to assist in establishing when an air quality assessment will be required. These criteria indicate that significant impacts on air quality are unlikely to occur where a development results in less than 25 HDV movements per day in locations within or adjacent to an AQMA and less than 100 HDV outside of an AQMA. It is therefore anticipated that construction traffic generated by the proposed development would result in a negligible impact on local NO_2 and PM_{10} concentrations and has not been considered any further in this assessment.

Construction/Fugitive Dust Emissions

9.3.4 Construction phase activities associated with the Proposed Development may result in the generation of fugitive dust emissions (i.e. dust emissions generated by site-specific activities that disperse beyond the construction site boundaries).

9.3.5 If transported beyond the site boundary, dust can have an adverse impact on local air quality. The IAQM has published a guidance document for the assessment of demolition and construction phase impact16.The guidance considers the potential for dust nuisance and impacts to human health and ecosystems to occur due to activities carried out during the following stages of construction:

- Demolition (removal of existing structures);
- Earthworks (soil-stripping, ground-leveling, excavation and landscaping);
- Construction (activities involved in the provision of a new structure); and
- Trackout (the transport of dust and dirt from the construction site onto the public road network where it may be deposited and then re-suspended by vehicles using the network).

9.3.6 A qualitative assessment of air quality impacts due to the release of fugitive dust and particulates (PM10) during the construction phase was undertaken in accordance with the methodology detailed in the IAQM guidance.

9.3.7 The assessment takes into account the nature and scale of the activities undertaken for each source and the sensitivity of the area to an increase in dust and PM10 levels, thus enabling a level of risk to be assigned. Risks are described in terms of there being a low, medium or high risk of dust impacts.

9.3.8 Once the level of risk has been ascertained, then site specific mitigation proportionate to the level of risk is identified, and the significance of residual effects determined.

9.3.9 The IAQM assessment is undertaken where there are:

- human receptors within 350m of the site boundary or within 50m of the route(s) used by construction vehicles on the public highway;
- human receptors up to 500m from the site entrance(s);
- ecological receptors within 50m of the site boundary, or within 50m of the route(s) used by construction vehicles on the public highway; and
- ecological receptors up to 500m from the site entrance(s).

9.3.10 It is within these distances that the impacts of dust soiling and increased particulate matter in the ambient air will have the greatest impact on local air quality at sensitive receptors.

9.3.11 A summary of the IAQM assessment methodology is provided in Appendix B.

Assessment of Significance

9.3.12 The IAQM assessment methodology recommends that significance criteria are only assigned to the identified risk of dust impacts occurring from a construction activity following the application of appropriate mitigation measures. For almost all construction activities, the application of effective mitigation should prevent any significant effects occurring to sensitive receptors and therefore the residual effects will normally be negligible.

9.4 Transport Pollution Assessment

Introduction

9.4.1 Potential impacts on air quality due to local traffic emissions have been predicted using the ADMS dispersion model (version 5.0.0.1, released March 2020, updated September 2020). This is a commercially available dispersion model and has been widely validated for this type of assessment and used extensively in the Air Quality Review and Assessment process.

9.4.2 The model uses detailed information regarding traffic flows on the local road network and local meteorological conditions to predict pollution concentrations at specific locations selected by the user. Meteorological data from the Exeter Meteorological Station for 2019 has been used for the assessment.

9.4.3 Quantitative assessment of the impacts on local air quality from road traffic emissions associated with the operation of the development have been completed against the current statutory standards and objectives set out in Table 3.1 for NO_2, PM_{10} and $PM_{2.5}$.

Emissions Data

9.4.4 The model has been used to predict road specific concentrations of oxides of nitrogen (NO_X) and particulate matter (PM_{10} and $PM_{2.5}$) at selected receptors.

9.4.5 The assessment has predicted air quality during 2019 for model verification. The emission factors released by Defra in August 2020, provided in the emissions factor toolkit EFT2021_v11.0[17] have been used to predict traffic related emissions of PM and NO_X.

9.4.6 Emission factors and background data used in the prediction of future air quality concentrations predict a gradual decline in pollution levels over time due to improved emissions from new vehicles and the gradual renewal of the vehicle fleet. In recent years the Defra emission factors published within the Emission Factor Toolkits (EFT) have been found to predict lower NO_X concentrations in future years compared to concentrations measures at roadside locations across

the UK. However, research carried out by Air Quality Consultants Ltd (AQC) has now shown that emissions of NO_X from vehicles within the recently released EFT are now matching concentrations recorded at roadside locations between 2013 to 2019. The report[18] concludes that '*the EFT is now unlikely to over-state the rate at which NOx emissions decline into the future at an 'average' site in the UK. Indeed, the balance of evidence suggests that, on average, NOx concentrations are likely to decline more quickly in the future than predicted by the EFT'.* This has removed the need for the use of any sensitivity tests for future year scenarios.

9.4.7 In light of the above the relevant future year EFT emissions data would usually be used to predict concentrations in the future year scenario, however, the anticipated completion year is 2029. This is some years ahead of the current baseline scenario and there is some uncertainty in predicting impacts that far into the future. To ensure a worst-case assessment emission factors from 2025 have been used to predict concentrations in 2029.

Background Concentrations

9.4.8 The ADMS model estimates concentrations arising as a result of vehicle emissions. It is necessary to add an estimate of local background concentrations to obtain the total concentration for comparison against the air quality objectives.

9.4.9 Estimated concentrations for NO2, PM10 and PM2.5 have been taken from the Defra 2018 based background maps, published in August 2020. Concentrations have been extracted from the 2019 maps for the grid square which represent the Site and adjacent road network. Data for 2019 has been used for the 2029 scenario as a cautious approach, assuming no decline in background levels between the base year and future year scenario.

9.4.10 Details of the background data used within the modelling assessment are provided in Table 5.3.

Traffic Data

9.4.11 Traffic data for use in the assessment has been provided by Stantec and are based on data set out within the Transport Assessment19.

9.4.12 Due to the Covid-19 pandemic it is not possible to make used of monitoring data for the model verification for 2020 or 2021. Model verification, as discussed in section 4.2.6 below, therefore needs to be carried out using 2019 monitoring data, thus requiring a baseline assessment year of 2019.

9.4.13 Future base follows for the 2029 assessment year have been calculated from the 2019 bae flows and including trips associated with other consented scheme in the area including the EUE providing data for the Do-minimum' scenario.

9.4.14 Trips associated with the proposed development, based on a total of 150 residential dwellings and ha of employment use have been added to the 2029 base flows to provide the 'do something' scenario.

9.4.15 The development trips have been screened against the following criteria set out within the IAQM air quality planning guidance:

- A change in LGV of more than 100 vehicles per day within or adjacent to an AQMA and a change of more than 500 elsewhere;
- A change in HGV of more than 25 vehicles per day within or adjacent to an AQMA and a change of more than 100 per day elsewhere.

9.4.16 Those road links which fall below the above criteria have been excluded from the assessment as impacts on local air quality are deemed to be negligible.

9.4.17 The traffic data used within the assessment are provided in Appendix C.

Model Outputs and Results Processing

9.4.18 The ADMS Model has predicted traffic related annual mean emissions of NOx and PM at a number of receptors along the road links set out in Table 4.1. Relevant background concentrations have subsequently been added to the model outputs to provide the total concentrations of each pollutant.

9.4.19 The predicted concentrations of NOx have been converted to NO2 using the LAQM calculator (Version 8.1, released August 2020) available on the Defra air quality website20..

9.4.20 Analysis of long-term monitoring data21 suggests that if the annual mean NO2 concentration is less than 60 µg/m3 then the one-hour mean NO2 objective is unlikely to be exceeded where road transport is the main source of pollution. Therefore, in this assessment the annual mean concentration has been used to screen whether the one-hour mean objective is likely to be achieved as recommended within LAQM.TG(16). Similar to NO2, an annual mean PM10 concentrations below 32 µg/m3 is used to screen whether the 24-hour PM10 mean objective is likely to be achieved, the approach also recommended within LAQM.TG(16).

Verification of Model Results

9.4.21 It is recommended that the model results are compared with measured data to determine whether the model results need adjusting to more accurately reflect local air quality. This process is known as verification.

9.4.22 LAQM.TG(16) recommends that model predictions should be within 25% (preferably 10%) of monitored concentrations for the model to be predicting with any degree of accuracy. Also, the guidance recommends that any adjustment factors applied to model results should be calculated based on verification using monitoring sites in a similar location i.e. roadside, intermediate or background sites.

9.4.23 To verify the model results, the ADMS model has been used to predict NOx concentrations at the monitoring site located on Blundell's Road (DT3, as detailed in the MDDC 2021 Air Quality Annual Status Report22). See Appendix D for further details on the verification method.

9.4.24 There is no suitable monitoring of PM data to allow verification of the PM model results. However, LAQM.TG (16) suggests applying the NOx adjustment factor to modelled road-PM where no appropriate verification against PM data can be carried out. Therefore, the adjustment applied to predicted NOx concentrations has also been applied to the modelled PM10 concentrations.

Selection of Receptors

9.4.25 As set out in Table 3.2, LAQM.TG(16) describes in detail typical locations where consideration should be given to pollutants defined in the Regulations. Generally, the guidance suggests that all locations 'where members of the public are regularly present' should be considered. At such locations, members of the public would be exposed to pollution over the time that they are present, and the most suitable averaging period of the pollutant needs to be used for assessment purposes.

9.4.26 For instance, on a footpath, where exposure would be transient (for the duration of passage along that path) comparison with short-term standards (i.e. 15-minute mean or 1-hour mean) may be relevant. In a school, or adjacent to a private dwelling, however; where exposure may be for longer periods, comparison with long-term standards (such as 24-hour mean or annual mean) may be most appropriate. In general terms, concentrations associated with long-term standards are lower than short-term standards owing to the chronic health effects associated with exposure to low level pollution for longer periods of time.

9.4.27 For the completion of this assessment, air quality has been predicted at sensitive receptors (residential properties and educational facilities) located adjacent to the road links set out in Table 4.1. Each receptor has been selected to represent worst-case exposure to local traffic emissions.

9.4.28 Four receptors have also been selected to represent the proposed development site to allow an exposure assessment to be undertaken.

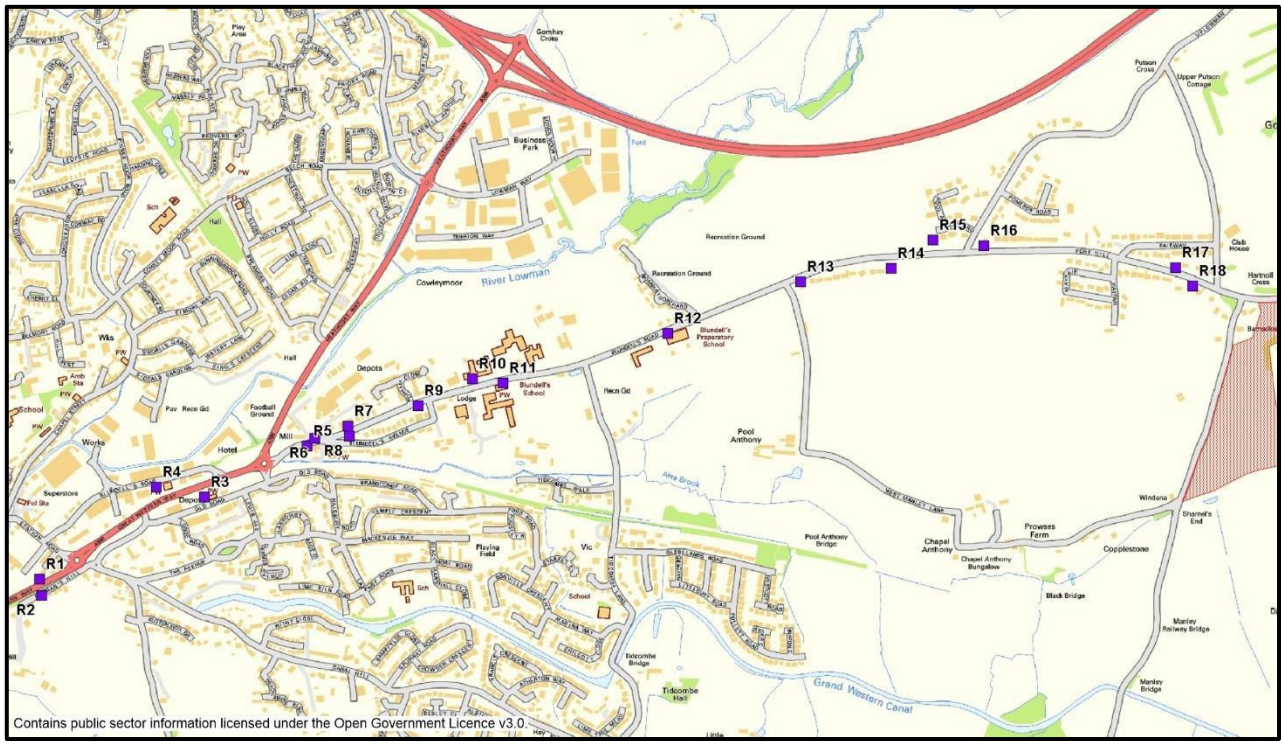
9.4.29 The details of each receptor are presented below in Table 9.2 and their locations shown in Figure 9.3.

Table 9.2: Location of Receptors used in ADMS Modelling Assessment

Receptor Number	Receptor Location	OS Grid Reference	Receptor Height (m)
R1	Coopers Court	295860, 112441	1.5
R2	Deymans Hill	295867, 112399	1.5
R3	St James Catholic Church	296288, 112653	1.5

R4	Cherith Christian Fellowship Church	296162, 112678	1.5
R5	1 Blundell's Road	296553, 112785	1.5
R6	2 Blundell's Road	296573, 112805	1.5
R7	3 Redland's, Blundell's Rd	296658, 112835	1.5
R8	2 Blundell's Avenue	296663, 112811	1.5
R9	Hudson Road	296841, 112889	1.5
R10	Blundell's School	296923, 112941	1.5
R11	Blundell's School	297060, 112947	1.5
R12	Blundell's Preparatory School	297486, 113076	1.5
R13	1 Putsen Cottages	297831, 113210	1.5
R14	Barnsmead	298065, 113244	1.5
R15	8 Pool Anthony Drive	298172, 113318	1.5
R16	1 Uplowman Road	298305, 113303	1.5
R17	40 Post Hill	298801, 113245	1.5
R18	49 Post Hill	298844, 113199	1.5

Figure 9.3: Sensitive Human Receptors used in Modelling



Significance Criteria

9.4.30 The guidance issued by EPUK & IAQM relates to Air Quality considerations within the planning process and sets criterion which identify the need for an Air Quality Assessment, the type of Air Quality assessment required, and the significance of any predicted impact.

9.4.31 The guidance suggests expressing the magnitude of incremental change in concentrations as a proportion of an Air Quality Assessment Level (AQAL) such as the air quality objectives set out in Table 3.1.

9.4.32 The significance of impact is then identified based on the incremental change in the context of the new total concentrations and its relationship with the assessment criteria, noting whether the impact is adverse or beneficial based on a positive or negative change in concentrations. The criteria suggested for assigning significance is set out in Table 9.3 below.

9.4.33 To assess the overall significance of the predicted impact the assessment draws on the approach used for undertaking environmental impact assessments where a moderate and major impact is deemed to be significant while a minor or negligible impact would not be classed as significant.

Table 9.3: Impact Descriptors for Individual Receptors

Long-term Average Concentration at Receptor in Assessment Year	% Change in Concentrations Relative to Air Quality Assessment Level (AQAL)			
	1	2-5	6-10	>10
75% or less of AQAL	Negligible	Negligible	Slight	Moderate
76-94% of AQAL	Negligible	Slight	Moderate	Moderate
95-102% of AQAL	Slight	Moderate	Moderate	Substantial
103-109% of AQAL	Moderate	Moderate	Substantial	Substantial
110% of AQAL	Moderate	Substantial	Substantial	Substantial

AQAL – Air Quality Assessment Level which in this assessment refers to the Air Quality Objectives set out in Table 3.1

The percentage change in concentration should be rounded to a whole number

The table should only be used with annual mean concentrations

The descriptors are for individual receptors only: overall significance should be based on professional judgment

When defining the concentrations as a percentage of the AQAL use the 'without scheme' concentration where there is a decrease in pollutant concentrations and the 'with scheme' concentrations for an increase

The total concentration categories reflect the degree of potential harm by reference to the AQAL value. At exposure, less than 75% of this value i.e. well below, the degree of harm is likely to be small. As exposure approaches and exceeds the AQAL, the degree of harm increases. This change naturally becomes more important when the result is an exposure that is approximately equal to, or greater than the AQAL

It is unwise to ascribe too much accuracy to incremental changes or background concentrations, and this is especially important when total concentrations are close to the AQAL. For a given year, it is impossible to define the new total concentrations without recognising the inherent uncertainty, which is why there is a category that has a range around the AQAL, rather than being exactly equal to it.

9.5 Low Emissions Assessment

9.5.1 A Low Emissions Assessment (LEA) has been carried out in accordance with the requirements of the MDDC Local Plan. The aim of the LEA is to determine the transport emissions associated with the development proposals both with and without mitigation in place and determine the impact of the proposals in financial terms. This data can then be used to develop a Low Emission Strategy (LES) for the site to effectively reduce impacts on local air quality.

9.5.2 The Local Plan recommends the use of the Low Emission Toolkit (LET) available on the Low Emission Strategy website23 to calculate development emissions and damage costs, however as discussed on the website, the latest LET was released in 2015. Underlying emission factors and damage costs used within the LET are now out of date therefore direct use of the software is no longer supported.

9.5.3 The LEA has therefore made use of the EFT2021_V11 to calculate the development transport emissions associated with the proposals before mitigation and following the implementation of the FTP.

9.5.4 The associated damage costs have been calculated using the 2021 damage cost appraisal toolkit published by Defra in March 202124. Using the following approach:

EFT output x Damage costs x 5 years = 5 year exposure cost value

Emissions have been calculated for the two key pollutants, NOx and particulates (PM2.5).

9.6 Construction Impacts

Site and Surroundings

9.6.1 The Site covers an area of approximately 13.6 ha (13,600 m2) and there are residential properties located within 350 m of the Site. An assessment of construction related impacts in relation to human receptors has therefore been undertaken.

9.6.2 Dust emissions from construction activities are unlikely to result in significant impacts on ecologically sensitive receptors beyond 50 m from the site boundary. A review of data held on the DEFRA MAGIC website26 shows that there are no designated nature conservation areas within 50 m of the Site boundary. Impacts on ecological receptors would not therefore be significant and has been scoped out for further assessment.

9.6.3 As discussed in Section 5, the PM10 concentrations, taken from the Defra background maps, in the vicinity of the Site are expected to be below the relevant objective limits (Table 5.2). The data indicates background concentrations in the region of 9-11 µg/m3 in the vicinity of the Site. Based on professional judgment, it is anticipated that PM10 concentrations at the Site and at adjacent properties are unlikely to be much higher than background, therefore PM10 concentrations are expected to be below 24µg/m3.

9.6.4 The precise behaviour of the dust, its residence time in the atmosphere, and the distance it may travel before being deposited would depend upon a number of factors. These include wind direction and strength, local topography and the presence of intervening structures (buildings, etc.) that may intercept dust

before it reaches sensitive locations. Furthermore, dust would be naturally suppressed by rainfall.

9.6.5 A windrose from the Exeter Meteorological Station is provided in Figure 9.4, which shows that prevailing winds are from the south/southwest and northwest directions. Areas most consistently affected by dust are influenced by prevailing winds that are generally located downwind of an emission source. Therefore, the highest risk of impacts would occur at receptors to the north/northeast and southeast of the Site, which includes the golf course, which would be of moderate sensitivity to dust effects and the adjacent HBC which would be of low sensitivity to dust effects.

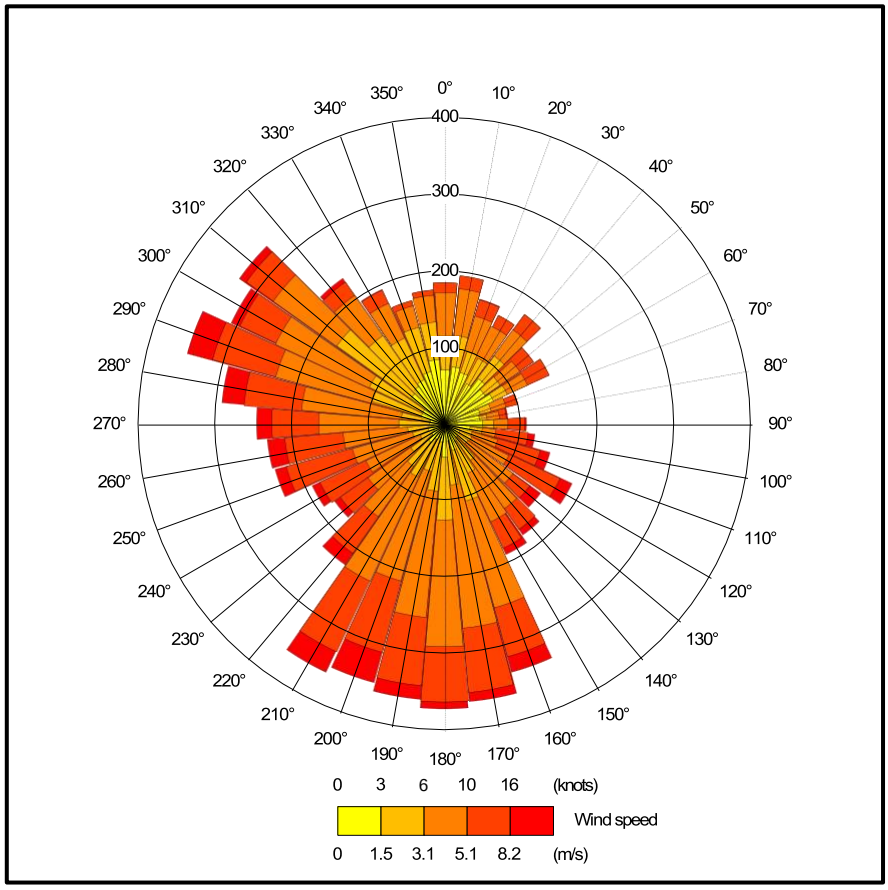


Figure 9.4: Windrose from Exeter Meteorological Station (2019)

9.7 Risk Assessment of Dust Impacts

Defining the Dust Emission Magnitude

9.7.1 With reference to the criteria detailed in Appendix B, the dust emission magnitude for each of the category's demolition, earthworks, construction and trackout have been determined. These have been summarised in Table 9.4.

Table 9.4: Dust Emission Magnitudes		
Activity	**Criteria**	**Dust Emission Magnitude**
Demolition	No demolition is required as part of this application	**n/a**
Earthworks	Building site area approximately 13,600 m^2, expected 5-8 HDV on site.	**Large**
Construction	Building volume between <100,000m^3, main construction material brick and concrete	**Large**
Trackout	Between 25-30 HDV (>3.5t) movements per day	**Medium**

Sensitivity of Surrounding Area

9.7.2 Using the criteria set out in Tables B2 to B4 in Appendix B, the sensitivity of the surrounding area to impacts from dust emissions has been determined and are set out in Table 6.2.

Dust Soiling

9.7.3 There are residential properties in close proximity to the Site, which are considered to be highly sensitive to dust effects, with 2 being within 20 m to the west, and a further 2 within 50m. The units within the existing HBC also lie within 20m of the Site boundary although these would be classed as low sensitive receptors. It is also noted that the EUE is located immediately to the west of the Site. At this stage it is not know how far from the site boundary new residential properties will be located. However, if completed and occupied prior to construction of the proposed development, the EUE area will become a high sensitivity receptor due to the presence of residential dwellings. As a worst-case it has been assumed that the closest properties will be within 20 m of the Site boundary, and these will be occupied during the construction phase. The sensitivity of the surrounding area in relation to dust soiling effects is therefore considered to be high.

9.7.4 There will be between 25-30 HDV (>3.5t) movements per day during the construction phase which will travel to and from the Site along Post Hill and Blundell's Road. As a general guide, significant impacts from trackout may occur up to 500 m from large sites, 250 m from medium sites and 50 m from small sites, as measured from the site exit. There are residential receptors located along Post Hill within 20 m of the roadside and within 500 m of the Site access point. The sensitivity of the area to dust soiling effects from trackout is therefore considered to be high.

PM_{10} Effects

9.7.5 As previously discussed, annual mean PM10 concentrations in the vicinity of the Site are expected to be below 24 µg/m3. Based on the proximity of sensitive receptors to the site boundary and the local concentrations of PM10 the sensitivity of the surrounding area is considered to be low with regards human health impacts.

Table 9.5: Sensitivity of Receptors		
Potential Impact		**Sensitivity at Site**
Dust Soiling (earthworks and construction)	Receptor Sensitivity	High
	Number of Receptors	>10 within 20 m, >10 within 50 m
	Sensitivity of the area	**Medium**
Dust Soiling (trackout)	Receptor Sensitivity	High
	Number of Receptors	>10 within 20m of roadside within 500 m of site access
	Sensitivity of the area	**High**
Human Health (earthworks and construction)	Receptor Sensitivity	High
	Annual Mean PM_{10} Concentration	< 24 µg/m^3
	Number of Receptors	>10 within 20 m, >10 within 50 m
	Sensitivity of the area	**Low**
Human Health (trackout)	Receptor Sensitivity	High
	Annual Mean PM_{10} Concentration	< 24 µg/m^3
	Number of Receptors	>10 within 20m of roadside within 500 m of site access
	Sensitivity of the area	**Low**

9.8 Defining the Risk of Impacts

9.8.1 The dust emission magnitude as set out in Table 9.4 is combined with the sensitivity of the area (Table 9.5) to determine the risk of both dust soiling and human health impacts, assuming no mitigation measures applied at site. The risk of impacts associated with each activity is provided in Table 9.6 below and has been used to identify site-specific mitigation measures, which are discussed in Section 9.1.1 and set out in Appendix D.

Table 9.6: Summary of Effects Without Mitigation		
Source	**Dust Soiling**	**PM_{10} Effect**
Demolition	n/a	n/a
Earthworks	High Risk	Low Risk
Construction	High Risk	Low Risk
Trackout	Medium Risk	Low Risk

9.9 Operational Impacts

Traffic Pollution Assessment

Existing Receptors

Nitrogen Dioxide

9.9.1 Annual mean NO2 concentrations predicted at the selected existing receptor locations are presented below in Table 9.7.

9.9.2 The modelling assessment is predicting annual mean NO2 concentrations well below (<75%) the annual mean objective of 40 µg/m3 (AQAL) at all the selected receptors in both the DM and DS scenarios.

9.9.3 Traffic generated by the operational development is predicted to increase annual mean NO2 concentrations by no more than 0.6 µg/m3. This equates to an increase of no mo9re than 2 % of the AQAL. Based on the criteria set out in Table 4.3, the predicted increase in NO2 is deemed to be of negligible significance given that concentrations remain at less than 75% of the AQAL (<30 µg/m3).

9.9.4 With predicted annual mean concentrations being less than 60 µg/m3, it is expected that the hourly objective of 200 µg/m3 will also be met at all locations and impacts in terms of short-term NO2 would be negligible.

Table 9.7: Predicted Annual Mean NO_2 Concentrations at Existing Receptors (µg/m^3)				
Receptor	**2029 Base**	**2029 Do Something**	**Change due to Proposed Development as a % of AQAL**	**Significance of Impact**

R1	14.4	14.5	0	Negligible
R2	13.5	13.7	0	Negligible
R3	10.4	10.5	0	Negligible
R4	9.4	9.6	1	Negligible
R4	13.0	13.7	2	Negligible
R6	11.5	11.9	1	Negligible
R7	10.5	10.8	1	Negligible
R8	11.3	11.8	1	Negligible
R9	12.1	12.7	2	Negligible
R10	9.3	9.6	1	Negligible
R11	10.2	10.7	1	Negligible
R12	12.2	12.4	1	Negligible
R13	10.9	11.2	1	Negligible
R14	8.6	8.7	0	Negligible
R15	8.1	8.2	0	Negligible
R16	9.2	9.4	1	Negligible
R17	9.7	10.0	1	Negligible
R18	9.2	9.4	1	Negligible

PM10 Concentrations

9.9.5 Predicted annual mean PM10 concentrations at the selected existing receptor locations are presented below in Table 9.8.

Table 9.8: Predicted Annual Mean PM_{10} Concentrations at Existing Receptors (µg/m^3)

Receptor	2029 Base	2029 Do Something	Change due to Proposed Development as a % of AQAL	Significance of Impact
R1	12.3	12.3	0	Negligible
R2	12.0	12.0	0	Negligible
R3	11.5	11.5	0	Negligible
R4	11.1	11.1	0	Negligible
R4	12.4	12.5	0	Negligible
R6	11.9	12.0	0	Negligible
R7	11.5	11.6	0	Negligible
R8	11.8	11.9	0	Negligible
R9	12.1	12.2	0	Negligible

R10	11.1	11.2	0	Negligible
R11	11.4	11.5	0	Negligible
R12	12.0	12.1	0	Negligible
R13	11.7	11.7	0	Negligible
R14	10.9	10.9	0	Negligible
R15	10.8	10.8	0	Negligible
R16	11.2	11.2	0	Negligible
R17	11.3	11.4	0	Negligible
R18	11.2	11.2	0	Negligible

9.9.6 The ADMS model is predicting annual mean PM10 concentrations at less than 75% of the AQAL of 40 µg/m3 at all receptor locations.

9.9.7 Traffic generated by the operational development is predicted to increase annual mean PM10 concentrations by no more than 0.1 µg/m3, which is less than 1% of the AQAL and therefore classed as a negligible impact based on criteria set out in Table 4.3.

9.9.8 As discussed in section 4.2.5, where annual mean PM10 concentrations fall below 32 µg/m3, exceedance of the 24-hour objective is considered unlikely. As annual mean concentrations are below this threshold at all the selected receptors, concentrations are predicted to be meeting the 24-hour objective limit of 50 µg/m3.

$PM_{2.5}$ Concentrations

9.9.9 Predicted annual mean PM2.5 concentrations at the selected existing receptor locations are presented below in Table 9.9.

9.9.10 The ADMS model is predicting annual mean PM2.5 concentrations at less than 75% of the AQAL of 25 µg/m3 at all receptors.

9.9.11 The operational development is predicted to increase/decrease annual mean PM10 concentrations by no more than 0.1 µg/m3, which is less than 1% of the AQAL and therefore classed as a negligible impact.

Table 9.9: Predicted Annual Mean $PM_{2.5}$ Concentrations at Existing Receptors ($\mu g/m^3$)				
Receptor	**2229 Base**	**2029 Do Something**	**Change due to Proposed Development as a % of AQAL**	**Significance of Impact**
R1	7.9	7.9	0	Negligible
R2	7.7	7.7	0	Negligible
R3	7.3	7.3	0	Negligible
R4	7.2	7.2	0	Negligible
R4	7.8	7.9	0	Negligible
R6	7.6	7.6	0	Negligible
R7	7.4	7.4	0	Negligible
R8	7.5	7.5	0	Negligible
R9	7.7	7.8	0	Negligible
R10	7.1	7.2	0	Negligible
R11	7.1	7.2	0	Negligible
R12	7.3	7.3	0	Negligible
R13	7.1	7.1	0	Negligible
R14	6.6	6.6	0	Negligible
R15	6.6	6.6	0	Negligible
R16	6.8	6.8	0	Negligible
R17	6.9	6.9	0	Negligible
R18	6.8	6.8	0	Negligible

Proposed Receptors (Exposure Assessment)

9.9.12 Annual mean NO2, PM10 and PM2.5 concentrations predicted during the 2029 Do-something scenario on Post Hill (R17 and R18), the main source of emissions influencing air quality at the Site, are well below the relevant annual mean objective limits. Concentrations at the Site will therefore remain well below the annual mean and short-term objective levels under the DS scenario.

9.9.13 The impact of the development in terms of new exposure would therefore be negligible.

9.10 Low Emission Assessment

Base Design

9.10.1 As discussed previously the application is for outline planning permission and would provide a mixed use development with up to 150 residential units and 3.9 ha of employment use. As the application is for outline permission full scheme design and on-site facilities have yet to be determined and therefore specific on-site mitigation measures are not known at this stage in the development process. However, the aim of the development is to provide a highly sustainable development and the current masterplan provides both pedestrian and cycle routes through the Site linking with the nearby National Cycle Route 3 and the adjoining EUE development, providing accessibility facilities in the local area and to the wider town. The Site is also within easy reach of the Grand Western Canal, which provides high-quality and direct leisure access into Tiverton town centre. The development is in close proximity to an existing bus stop on Post Hill to the west of the HBC providing good access to local buses. However, a new bus stop would also be provided on Post Hill adjacent to the northern boundary to provide easy access to the local bus network for the proposed residential uses and therefore facilities within the wider area, including the railway line at Sampford Peverell. It is also anticipated that the scheme will include the following which would contribute to a reduction in pollutant emissions in relation to both vehicle and building emissions:

- Ultra low carbon homes;
- Dwelling orientation to maximise solar gains;
- Opportunities for electric vehicle charging points within dwellings;
- Provision of safe pedestrian and cycle connections to local facilities;
- Provision of all electricity and heating to the employment uses from the AD plant located on the adjacent farm providing a low-carbon, renewable source of energy;
- Extension to existing footpath on Post Hill to improve pedestrian accessibility;
- Improved pedestrian crossing on Manley Lane and Post Hill;

Base Fleet Emissions

9.10.2 Stantec has provided data on the daily average number of vehicles generated by the operational development.

9.10.3 The data indicates a daily trip rate of 1666 vehicles with 3 % of these being HGV.

9.10.4 Using the EFT emissions data the total annual emissions of NOx and PM2.5 have been calculated as set out in Table 9.10 below prior to implementing any mitigation measures. The assessment has assumed an average of 56 kph and an average distance travelled of 10 km per vehicle. The emissions have been calculated based on the future 2029 operational year.

Table 9.10: Calculated Annual Emission from Operational Development

Pollutant	Annual Emissions (kg/yr)	
	2029 with no Mitigation	2029 with Mitigation[1]
NO_x	834	753
$PM_{2.5}$	114	102

1 mitigation measures applied through the Travel Plan resulting in an assumed 15% reduction in traffic generation

Design Mitigation

9.10.5 As detailed previously as the application is at outline planning stage comprehensive mitigation measures are not known. However, a Travel Plan (TP) has been developed for the scheme by Stantec27. The TP sets out a strategy for the introduction of a package of measures aimed at discouraging the use of Single Occupancy Vehicle (SOV) movements and encourage the adoption of sustainable modes of transport such as walking/cycling, public transport, car sharing and electric vehicles (EVs). The TP includes the following:

- Appointment of Travel Plan Coordinator (TPC);
- Provision of a Travel Information Pack (TIP) to all new residents providing information on travel options including:
  - details of the TP measures and its objectives and targets;
  - walking and cycle maps showing safe routes to local facilities;
  - site specific public transport information with a map

showing routes and bus stop locations;

- generalised public transport information for the local area;
- information on car sharing arrangements for the development including Car Share Devon leaflets;
- information on supermarkets offering home delivery in the local area;
- information on the benefit of EV vehicles and government grants for the installation of EV charging points/authorised installers;
- information on working from home and its benefits;
- contact details for the TPC.

- Provision of an annual travel newsletter for the life of the TP to each household and employee;
- Provide up to date travel information on developers website easily accessible by all occupants of the Site;
- Provision of information to residents about micromobility options such as e-scooters, e- skateboards, e-bikes, e-mopeds, hover boards and Segway's, including current legislation and regulations, operation and results of e-scooter trials and where to access or purchase micromobility options;
- Promotion of car sharing;
- Provide residents with details of ECO-driving and encourage economical driving practices;
- Provision of green travel voucher application to all residents;
- Provision of up to £500 per event to encourage Sustainable Travel Promotional Events within the Site;
- Provision of travel plan noticeboards, displaying information on bus timetables, cycle and walking routes, car share promotion etc;
- Promote local initiatives such as Walk to Work Week, Bike Week, special modal type days, national and local travel awareness schemes;
- Promote and encourage 'work from home' and ' flexible working';
- Undertaking of travel surveys/monitoring.

9.10.6 It is anticipated that the implementation of the TP would result in a 10% reduction in trips generated by the operational development, reducing the overall daily trip generation to 1504 per day. The reduction in annual NO_X and $PM_{2.5}$ emissions as a result of this reduced trip generation is provided in Table 7.1.

9.10.7 The annual damage cost associated with the operation of the development, based on a daily trip generation of 1666 and assuming an average trip length of 10 km, would be £39,952 for NO_X and £47,490 for PM_{10}, giving a total damage cost of £87,442 over the first 5 years of operation.

9.10.8 Following the implementation of the TP the damage costs would be reduced to £36,072 for NO_X and £42,867 for PM_{10} per annum, reducing the total five year damage cost to £78,939, a reduction of £8,503.

9.10.9 Additional measures that could be considered include which would potentially contribute to an increase in sustainable travel and further reduction in vehicle trips includes:

- Extension of street lighting along Post Hill to improve facilities for pedestrians and cyclists;
- Provision of adult cycle training as part of the TP;
- Provision of secure cycle parking at each property, particularly those properties with no garage;
- provision of necessary infrastructure to facilitate internet connections to enable working and shopping from home.

9.10.10 It is envisaged that following the implementation of additional measures determined at the detailed planning stage the total annual emissions of NO_X and $PM_{2.5}$ would be reduced further resulting in a lower damage cost over the first five year, however these cannot be quantified at this stage in the design process.

9.11 Mitigation Measures

Construction Phase

9.11.1 The control of dust emissions from construction site activities relies upon management provisions and mitigation techniques to reduce emissions of dust and limit dispersion. Where dust emission controls have been used effectively, large-scale operations have been successfully undertaken without impacts to nearby properties.

9.11.2 The proposed development has been identified as a medium to high-risk site for dust soiling effects during earthworks, construction and track and a negligible risk site during demolition as set out in Table 6.3.

9.11.3 The developer should therefore implement appropriate dust and pollution control measures as set out within the IAQM guidance. A summary of these measures is set out in Appendix D. The proposed measures should be set out within a CMP and approved by MDDC prior to commencement of any work on site.

9.11.4 Following implementation of the measures recommended for inclusion within the CMP the impact of emissions during construction of the proposed development would be negligible.

Operational Phase

9.11.5 The assessment has predicted a negligible impact on NO2, PM10 and PM2.5 concentrations as a result of traffic generated by the proposed development. The exposure assessment has also shown that the development would not introduce new receptors into a location of poor air quality, therefore no mitigation in relation to exposure is required. However, it is recognised that cumulatively the development would contribute to local emissions through additional vehicle movements on the network.

9.11.6 As detailed in section 7.2, the development would make provision for electric vehicle infrastructure and would implement a TP. These would form part of an LES for the Site.

9.11.7 Further measures for inclusion within the LES would be determined at the detailed design stage as would the on-site technology measures aimed at encouraging emissions reduction technologies from existing vehicles and/or enabling and promoting the uptake of newer and alternative fuelled vehicles.

9.11.8 It is recommended that at the detailed design stage, once more detailed information is available on measures for inclusion within the LES and relating to on-site mitigation, a more detailed emissions assessment is undertaken. This would provide a more accurate indication of the impact of the development on emissions to air and the monetary impact determined from the damage cost calculation. The requirement for any further off-site mitigation can then be determined.

9.12 Residual Effects

Construction Phase

9.12.1 The greatest potential for dust nuisance problems to occur would generally be within 200m of the construction site perimeter. There may be limited incidences of increased dust deposited on property beyond this distance.

9.12.2 By following the mitigation measures outlined within this appraisal the impact would be substantially minimised and residual impacts are unlikely to be significant.

Operational Phase

9.12.3 Residual impacts of the development are considered to be negligible with regards human health at the Site and during the operational phase of the development. However, the development would result in additional NOx and PM emissions as determined by the LEA, however the measures set out within the TP would results in a reduction in total emissions from the operational development which equates to a reduction of £8,503 in damage costs over the first five-year period. However, the residual impact in relation to overall emissions cannot be determined as negligible and further mitigation should be considered at the detailed design stage.

9.13 Conclusion

9.13.1 Kairus Ltd was commissioned by Waddeton Park Ltd to carry out an air quality assessment for the proposed development of land adjacent to HBC to provide up to 150 new residential dwellings and 3.9 ha of employment land.

9.13.2 It is inevitable that with any development construction activities would cause some disturbance to those nearby and the assessment has predicted a high risk of effects prior to the implementation of any on-site mitigation. However, following the implementation of appropriate mitigation measures, which would be set out within a CMP, impacts associated with the construction of the development are likely to be insignificant.

9.13.3 The ADMS dispersion model has been used to predict the impact of the operational development on local NO2, PM10 and PM2.5 concentrations (Traffic Pollution Assessment). The assessment has predicted an overall negligible impact on NO2, PM10 and PM2.5 concentrations as a result of traffic generated by the development on receptors within Tiverton. Furthermore, the exposure assessment has concluded that the development would not introduce new receptors into a location or poor air quality and impacts associated with new exposure would also be negligible.

9.13.4 A Low Emissions Assessment has been undertaken to determine the impact of the operational development on total emissions of NOx and PM2.5 to air. The damage costs associated with these emissions have been calculated as £87,442 over the first five years of operation. However, the assessment has taken into consideration the potential reduction in vehicle trips that would occur as a result of implementing a Travel Plan. It has been assumed that there would be a 10% reduction in vehicles generated by the operational development which would result in a reduction in NOx emissions of 81 kg/yr and a reduction in PM10 emissions of 11 kg/yr, which equates to a reduction in damage costs of £8,503 over the first five years. However, as the proposals are for outline planning permissions the full scheme design and on-site facilities have yet to be determined and therefore specific on-site mitigation measures are not known at this stage in the development process.

9.13.5 The measures currently set out for inclusion within the Travel Plan would form part of an overall LES for the Site. Further measures for inclusion within the LES would be determined at the detailed design stage as would any on-site technology measures aimed at encouraging emissions reduction technologies

from existing vehicles and/or enabling and promoting the uptake of newer and alternative fuelled vehicles.

9.13.6 It is recommended that at the detailed design stage, once more comprehensive information is available on measures for inclusion within the LES and in relation to on-site mitigation a more detailed Low Emissions Assessment is undertaken. This would provide a more accurate indication of the reduction in emissions resulting from the implementation of the overall package of low emission measures and the resulting reduction in damage costs. The requirement for any further off-site mitigation can then be determined.

10. Ground Conditions and Contamination

10.1 Introduction

10.1.1 A desk study and preliminary intrusive investigation and report has been compiled by GeoConsulting Engineering Ltd, which is attached as Technical Appendix 10.1.

10.1.2 The desk study has identified localised potential on-site land uses that could have given rise to significant potential contamination. In particular the records show that there was a landfill operation on, or very close to the southern boundary of the site. A former gravel pit to the east of the site may have been filled and consequently may present a risk of ground gas or leachate migration although the age of this feature and the separation distance make significant impact unlikely. A majority of the site has been in agricultural use since the first edition maps of 1889.

10.1.3 Potential exists for localised areas of made ground and or localised contaminant impact associated with the commercial trading areas proximal to the farm. Additionally it is possible that use of agro-chemicals on the farm land and pesticides/herbicides on the adjacent, now disused, rail line may have resulted in localised residues. Similarly, there may be locally elevated arsenic levels in areas of former orchards due to historic use of arsenate solutions as pesticides.

10.1.4 Whilst the issues above, if found to be present, may require specific mitigation measures they would not be envisaged to be of sufficient magnitude or complexity as to prevent redevelopment of the site.

10.1.5 The geology underlying the site is mapped to comprise sandstones of the Tidcombe Sand Member with Superficial Colluvium deposits in lower lying areas. These strata and the topography of the site would not be expected to give rise to any inherent instability.

10.1.6 It is therefore concluded that there are no matters that give rise to significant environmental concerns.

11. Landscape and Visual Impact

11.1 Introduction

11.1.1 A Landscape and Visual Appraisal has been carried out by Define (and is attached as Technical Appendix 11.1).

11.2 Key Mitigation Principles

11.2.1 The landscape and visual appraisal defined the likely landscape impacts of the scheme on the existing attributes of the site and the potential visual impacts on the various receptors identified by the baseline assessment. This lead to the identification of key design considerations, which in turn informed the establishment of the guiding principles for the scheme. Mitigation measures were then incorporated into the proposals to reduce the significance of the residual impacts and to maximise opportunities for enhancements and beneficial impacts.

Assessment

11.2.2 The assessment of the potential landscape and visual impacts has been carried out with reference to the guiding principles identified in the County and Mid Devon Landscape Character Assessments and the adopted Masterplan SPD for the Tiverton EUE. Following the establishment of the mitigation measures, it is concluded that the proposals would not result in any significant residual impacts.

11.2.3 The 'landscape-led' approach to the proposals has therefore allowed opportunities to maintain and reinforce local character by the retention and enhancement of the existing landscape pattern within the application site to be maximised. While it is acknowledged that the proposals will inevitably introduce a substantial amount of built development into the landscape, the design of the proposals and the character of the receiving environment mean that the development will not be unduly conspicuous in the landscape and will not result in significant impacts to the character of the rest of the Lowland Plain character area.

11.2.4 It is anticipated that all the new and existing landscape features within the site would benefit from an agreed programme of management, which would help to secure their long term viability within the landscape and enhance bio-diversity along existing and new wildlife corridors across the site.

11.2.5 The landscape east of Tiverton is undergoing notable change as a result of planning applications relating to EUE Part A being approved and constructed. This change is set to continue as further planning applications related to the EUE allocation are bought forward and then constructed, to be followed by proposals within EUE Part B. As a result of proposals associated with the EUE, the existing agricultural fields closest to the existing edge of Tiverton are being removed and replaced with land uses more typical of a suburban or peri-urban landscape.

11.2.6 While currently the rural character of the site and its immediate surroundings is fairly strong and intact, with only distant views of existing built form within Tiverton, this will change as a result of the EUE. Development of residential and employment land uses on the site assessed by this report, would further extend the land uses and character of the emerging proposals within the EUE, and would contribute to an extension of a residential and suburban land use and character, contributing to a change in the existing local landscape character.

11.2.7 Existing views across the site will be altered by both the proposals within the Hartnoll Farm site, and by proposals within EUE. Although there are few nearby residential receptors, those that there are, on the south eastern edge of Post Hill, and scatted along Manley Lane and Crown Lane, will experience close range views of a new landscape.

11.2.8 Recreational receptors using the Great Western Canal Towpath to the south of the Site will also experience views of both the development proposed at Hartnoll Farm, and within the EUE. The introduction of employment and residential land use to the view will not in itself be a completely new feature, but the proposals will occupy a larger percentage of views and be more prominent. Although the proposed development would become a new feature of some local views, and alongside the proposals of EUE, will alter the existing landscape character, the

scheme has been developed to ensure that key landscape features are retained, to ensure some continuity to landscape character and baseline views.

11.2.9 The proposals will ensure that the proposed development, while visible as a new landscape feature, will be well integrated to the existing landscape character, and will not appear out of place. While this LVA concludes that the proposals will result in a change to the landscape character and views experienced by sensitive receptors, assuming careful detailed design of the exact orientation, height, materials and colour of the proposed development, and installation of a well designed and managed landscape framework, the overall effect could be neutral

11.2.10 Consequently, there are no landscape or visual reasons why outline planning permission for the proposals should not be granted.

12.0 Noise & Vibration

12.1 Introduction

12.1.1 This chapter considers the likely noise and vibration effects of the proposed development; specifically the effects of noise and vibration generated by the proposed development on surrounding properties, during the construction and operation of the proposed development.

12.1.2 Acoustic Associates SW Ltd were commissioned by Waddeton Park Ltd to produce a Noise & Vibration Impact Assessment for the proposed outline mixed use development of land at Hartnoll Farm, Tiverton, to include an extension to the existing business park for up to 3.9 ha of new employment land and up to 150 residential units with associated access roads, open space and landscaping.

12.1.3 Public Health at Mid Devon Council have provided their Consultee Comments2 which in part addresses the subject of noise stating; Noise & other nuisances: An application for mixed commercial and residential use adjacent to a large urban expansion area, existing farmstead and close to the main link road will require a noise report and this has not been submitted or mentioned in the planning statement. We recommend that this report should be submitted before determination of this application because the outcome may influence site layout and infrastructure in order to protect both existing and future residents.

12.1.4 This report sets out the findings of a week-long environmental sound survey at Hartnoll Farm, providing a snap-shot of current noise levels from both the existing road network (Post Hill), as well as the business park. Traffic noise, from Post Hill represents a low risk of adversely effecting future residents and employing all the elements of good acoustic design at detailed design stage will ensure that good Standards will be achieved.

12.1.5 There is comparatively little noise coming from the existing Business Park, other than the noise created by infrequent delivery vehicles. Noise from fixed plant was not found to be of significance and no ground borne vibration was observed. The Detailed Design of the development will need to consider increasing the height of the bunding around the western boundary of the business park, the inclusion of a substantial green buffer strip, placing residential access roads

alongside this buffer strip to maximize separation distances between the employment land and the new housing.

13 Waste Management

13.1 Introduction

13.1.1 This chapter assess the effect of the proposed scheme on waste production and management. In particular, it considers the potential effects of waste generation from the construction phase.

13.1.2 Surplus material and waste may occur where material supply exceeds on-site demand. Surplus materials and waste could arise from existing site materials e.g. excavation of materials from earthworks, which cannot be used in the proposed scheme, or from materials that are brought to site but are not fully utilised for their original purpose, which can result in waste through damage, off-cuts and surplus products.

13.2 Policy Context

National Policy

National Planning Policy Framework

13.2.1 The National Planning Policy Framework (NPPF, 2021) does not provide specific guidance on planning policy relating to waste and states that *"the Framework should be read in conjunction with the Government's planning policy for waste"* (paragraph 4)

National Planning Policy for Waste

13.2.2 The National Planning Policy for Waste was published in October 2014 and is to be read in conjunction with the Waste Management Plan for England (2013).

13.2.3 The policy indicates a number of requirements for local planning authorities when determining planning applications for both waste and non-waste developments, preparation of local plans and identification of waste sites. In determining planning for non-waste developments, the policy indicates that planning authorities should ensure that:

- The likely impacts of proposed, non-waste related development on existing waste management facilities, and on sites and areas allocated for waste management, is acceptable and does not prejudice the implementation of the waste hierarchy and/or the efficient operation of such facilities.
- The handing of waste arising from the construction and operation of development maximises reuse/ recovery opportunities and minimises off-site disposal.

Waste Management Plan for England

13.2.4 The Waste Management Plan for England provides an analysis of the current waste management situation in England and fulfils the mandatory requirements of Article 28 of the revised Waste Framework Directive (WFD). This requires that Member States ensure that their competent authorities establish one or more waste management plans covering all of their territory.

13.2.5 The Plan does not introduce new policies or change the landscape of how waste is managed in England. Its core aim is to bring current waste management policies under the umbrella of one national plan. It supersedes the Waste Strategy for England 2007.

13.2.6 The UK is committed to meeting its target under the WFD of recovering at least 70% by weight, of construction and demolition waste by 2020. England and the UK are already achieving an estimated 93% recovery rate of construction and demolition waste.

Local Policy

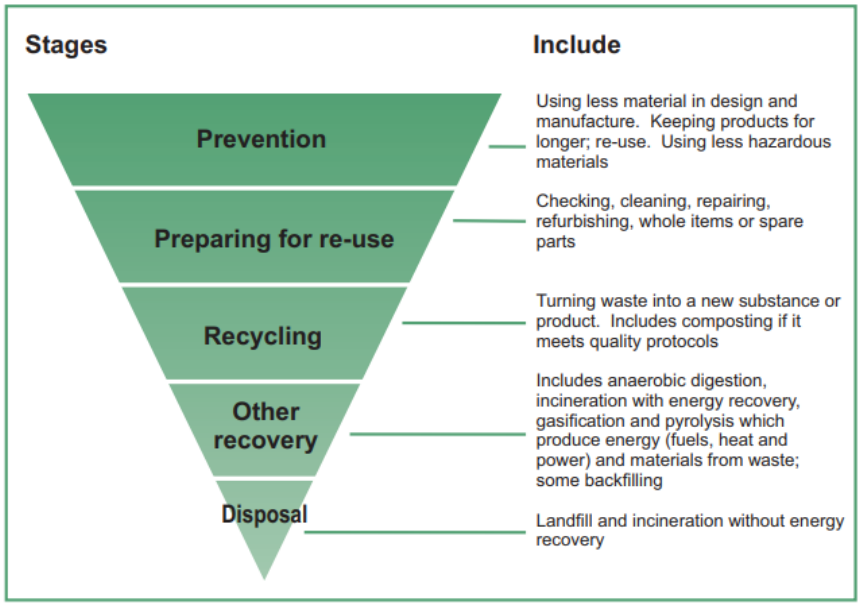
13.2.7 The Devon Waste Plan was adopted in December 2014 and provides a policy framework for decisions by planning applications for waste management development.

13.2.8 Policy W4 of the Plan relates to waste prevention and requires the provision of waste audit statements for major development proposals to ensure that waste generation is minimised in construction projects and subsequent occupation of sites and that any waste generated is managed through the waste hierarchy (see figure 13.1 below). Such reports are provided at either full/ reserved

matters application stage and this is reflected in the comments provided by Devon County Council to the application (dated 24th August 2021), where they have indicated that a condition could be attached to an outline permission.

13.2.9 The waste hierarchy (shown in figure 13.1 below) sets out a priority order to be applied to waste management legislation and policy to encourage waste management options that deliver the best overall environmental outcome. The levels of the waste hierarchy in descending order of preference are: prevention, preparation for reuse, recycling, other recovery and disposal.

Figure 13.1 – Waste Hierarchy



13.2.10 The waste hierarchy has been implemented in England and Wales by the Waste (England and Wales) Regulations 2011 (as amended). These regulations require that an establishment or undertaking that imports, produces, collects, transports, recovers or disposes of waste must take reasonable steps to apply the waste hierarchy when waste is transferred or disposed of.

13.3.1 This assessment has been carried out as a desk-based study, involving a review of applicable guidance and the quantification, where practicable, of estimated materials consumption and solid waste generation. It is concluded that no significant environmental effects will arise.

14.0 Utilities

Sewerage

14.1.1 It is proposed to serve the development via a connection to the mains sewer. SWW records show public foul (or combined) sewers running parallel to Post Hill. It is proposed to connect to this sewer. SWW have a legal duty to accept the connection and, if necessary, to carry out any improvements to the existing system that the connection necessitates.

Water Supply

14.1.2 A mains water supply is available (again running parallel to Post Hill) and will be provided via an extension of the existing mains supply in the locality.

Gas

14.1.3 There are gas service pipes in the existing residential area. There is an Intermediate and Low Pressure system locally. Gas supply for the proposed new employment floorspace will be via an extension of the existing mains provision.

Electricity

14.1.4 Western Power Distribution records show underground and over ground cables of various voltages High and Low in the area. The residential development is proposed to be served via an extension of the existing main supply whilst the new employment area will be supplied via a new underground pipeline connection to the existing Anerobic Digester that is located on adjacent land.

14.1.5 Surplus heat from the AD plant will be piped to serve the new employment area.

Telecommunications

14.1.6 British Telecommunications records show overhead and underground cables within the area. No capacity issues serving the development proposal have been identified.

15. Cumulative Effects

15.1 Introduction

15.1.1 The schemes included (unless specifically stated otherwise in a technical chapter) for the assessment of cumulative effects are identified in Chapter 2, Table 1.1.

15.1.2 In relation to cumulative effects, this ES contains an assessment of two types of effect:

- The combination of individual effects (e.g. noise, dust, traffic, visual) from the development on a particular receptor; and
- Effects from several developments, which individually might be insignificant, but when considered together would create a significant cumulative effect.

15.1.3 The first type of cumulative effects are dealt with solely in this Chapter. In terms of second type of effects these are dealt within each of the technical chapters (Chapters 3 to 14).

15.1.4 The receptors which are expected to experience an impact that is created by way of a combination of individual effects from the proposed development are existing residential properties/premises that are within close proximity of the site (within 1km).

Construction

15.1.5 During the construction phase it is predicted that these receptors will be exposed to a range of individual impacts from noise, dust, visual impacts and construction traffic. As a result it is expected that the receptors would

experience a temporary adverse cumulative effect during the construction phase.

15.1.6 Mitigation in response to this includes the agreement and implementation of a CEMP and adherence to best/good practice in terms of construction methods, to ensure impacts are effectively controlled and reduced. In terms of noise and vibration effects these can be adequately mitigated against using Best Practical Means, as defined in section 72 of the Control of Pollution Act and also by following the general principles of BS5228:1990. With regard to dust and air quality effects, best practice measures based on Building Research Establishment (BRE) guidance and other bodies must be used to mitigate any impacts.

Operational

15.1.7 Once operational it is predicted that the local receptors will be subject to a cumulative impact that relates to a range of individual impacts that include increased traffic, emissions, and visual and landscape impact.

15.1.8 The mitigation identified in relation to these impacts within each of the topic chapters will help reduce the cumulative effect on these local receptors.