

Test Valley Local Plan 2040

Habitat Regulations Assessment

Test Valley Borough Council

January 2024

Quality information

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1. Introduction

Background to the Project

- 1.1 AECOM was appointed by Test Valley Borough Council to produce a report to inform the Council's Habitats Regulations Assessment (HRA) of the potential effects of the Test Valley Local Plan 2040 on the National Site Network of Special Areas of Conservation, Special Protection Areas and Ramsar sites. For simplicity these sites are referred to as European sites throughout this report. The objectives of the assessment are to:
- Identify any aspects of the Local Plan 2040 that would cause an adverse effect on the integrity of European sites either alone or in combination with other plans and projects; and
 - To advise on appropriate policy mechanisms for delivering mitigation where such effects were identified.
- 1.2 The HRA of the Test Valley Local Plan 2040 is required to determine if there are any realistic linking pathways present between a European site and the Local Plan 2040 and where Likely Significant Effects cannot be screened out, an analysis to inform Appropriate Assessment is undertaken to determine if adverse effects on the integrity of the European sites will occur as a result of the Local Plan 2040 alone or in combination.

Legislation

- 1.3 The need for HRA is set out within the Conservation of Habitats & Species Regulations 2017 (**Box 1**). European sites (also called the National Site Network) can be defined as actual or proposed/candidate Special Areas of Conservation (SAC) or Special Protection Areas (SPA). It is also Government policy for sites designated under the Convention on Wetlands of International Importance (Ramsar sites) to be treated as having equivalent status to European sites.

Box 1: The legislative basis for Habitats Regulations Assessment

Conservation of Habitat and Species Regulations 2017 (as amended)

“A competent authority, before deciding to ... give any consent, permission or other authorisation for a plan or project which ... is likely to have a significant effect on a European site or a European offshore marine site (either alone or in combination with other plans or projects) ... must make an appropriate assessment of the implications for that site in view of that site's conservation objectives ... The authority shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the European site ...”

- 1.4 The Habitats Regulations applies the precautionary principle to European sites. Plans and projects can therefore only be permitted having ascertained that there will be no adverse effect on the integrity of the site(s) in question. Plans and projects may still be permitted if there are no alternatives to them and there are Imperative Reasons of Overriding Public Interest (IROPI) as to why they should go ahead. In such cases, compensation would be necessary to ensure the overall integrity of the site network.
- 1.5 In 2018, the 'People Over Wind' European Court of Justice (ECJ) ruling¹ determined that 'mitigation' (i.e., measures that are specifically introduced to avoid or reduce the harmful effects of a plan or project on European sites) should not be taken into account when forming a view on likely significant effects. Mitigation should instead only be considered at the appropriate assessment stage. Appropriate assessment is not a technical term: it simply means 'an assessment that is appropriate' for the plan or project in question. As such, the law purposely does not prescribe what it should consist of or how it should be presented; these are decisions to be made on a case-by-case basis by the competent authority.
- 1.6 Over the years the phrase 'Habitats Regulations Assessment' has come into wide currency to describe the overall process set out in the Conservation of Habitats and Species Regulations from screening through to

¹ Case C-323/17

Imperative Reasons of Overriding Public Interest (IROPI). This has arisen in order to distinguish the process from the individual stage described in the law as an 'Appropriate Assessment'. Throughout this report we use the term Habitats Regulations Assessment for the overall process.

Report Layout

- 1.7 **Chapter 2** of this report explains the process by which the HRA has been carried out. **Chapter 3** includes the Test of Likely Significant Effects of the policies and site allocations of the Plan considered 'alone' and 'in-combination'. **Chapter 4** covers the appropriate assessment of any policies which have a likely significant effect. **Chapter 5** contains the conclusion and a summary of recommendations.

2. Methodology

Introduction

- 2.1 This section sets out the approach and methodology for undertaking the Habitats Regulations Assessment (HRA).

A Proportionate Assessment

- 2.2 Project-related HRA often requires bespoke survey work and novel data generation in order to accurately determine the significance of effects. In other words, to look beyond the risk of an effect to a justified prediction of the actual likely effect and to the development of avoidance or mitigation measures.
- 2.3 However, the draft MHCLG guidance² (described in greater detail later in this chapter) makes it clear that when implementing HRA of land-use plans, the Appropriate Assessment (AA) should be undertaken at a level of detail that is appropriate and proportional to the level of detail provided within the plan itself:

“The comprehensiveness of the [Appropriate] assessment work undertaken should be proportionate to the geographical scope of the option and the nature and extent of any effects identified. An AA need not be done in any more detail, or using more resources, than is useful for its purpose. It would be inappropriate and impracticable to assess the effects [of a strategic land use plan] in the degree of detail that would normally be required for the Environmental Impact Assessment (EIA) of a project.”

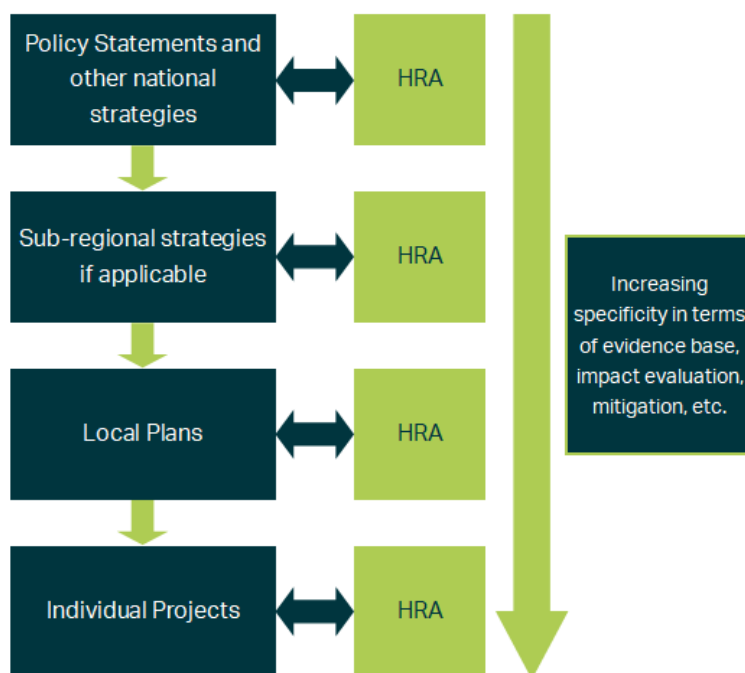
- 2.4 More recently, the Court of Appeal³ ruled that providing the Council (competent authority) was duly satisfied that proposed mitigation could be “*achieved in practice*” then this would suffice to meet the requirements of the Habitat Regulations. This ruling has since been applied to a planning permission (rather than a Plan document)⁴. In this case the High Court ruled that for “*a multistage process, so long as there is sufficient information at any particular stage to enable the authority to be satisfied that the proposed mitigation can be achieved in practice it is not necessary for all matters concerning mitigation to be fully resolved before a decision maker is able to conclude that a development will satisfy the requirements of reg 61 of the Habitats Regulations*”.
- 2.5 In other words, there is a tacit acceptance that AA can be tiered and that all impacts are not necessarily appropriate for consideration to the same degree of detail at all tiers as illustrated in **Box 2**.

² MHCLG (2006) Planning for the Protection of European Sites, Consultation Paper

³ No Adastral New Town Ltd (NANT) v Suffolk Coastal District Council Court of Appeal, 17 February 2015

⁴ High Court case of R (Devon Wildlife Trust) v Teignbridge District Council, 28 July 2015

Box 2: Tiering in HRA of Land Use Plans



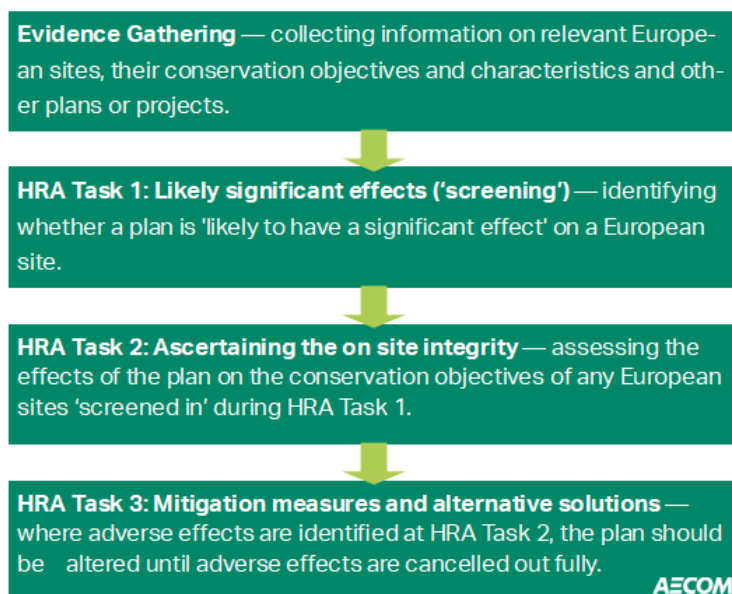
- 2.6 At the same time, it is necessary to have confidence that sites allocated in the Local Plan 2040 have a reasonable prospect of being deliverable without fundamental Habitats Regulations Assessment issues.
- 2.7 The most robust and defensible approach to the absence of fine grain detail at this level is to make use of the precautionary principle. In other words, the plan is never given the benefit of the doubt (within the limits of reasonableness); it must be assumed that a policy/measure is likely to have an impact leading to a significant adverse effect upon an internationally designated site unless it can be clearly established otherwise.

The Process of HRA

- 2.8 Central government have released general guidance on appropriate assessment.⁵ **Box 3** outlines the stages of HRA according to guidance. The stages are essentially iterative, being revisited as necessary in response to more detailed information, recommendations, and any relevant changes to the plan until no likely significant effects remain.

⁵ <https://www.gov.uk/guidance/habitats-regulations-assessments-protecting-a-european-site>

Box 3: Four-Stage Approach to Habitats Regulations Assessment



2.9 The following process has been adopted for carrying out the subsequent stages of the HRA.

Task One: Test of Likely Significant Effects

2.10 The first stage of any Habitats Regulations Assessment is a test of Likely Significant Effects - essentially a high-level assessment to decide whether the full subsequent stage known as Appropriate Assessment is required. The essential question is:

2.11 *“Is the Plan, either alone or in combination with other relevant projects and plans, likely to result in a significant effect upon European sites?”*

2.12 In evaluating significance, AECOM have relied on professional judgment and experience of working with the other local authorities on similar issues. The level of detail concerning developments that will be permitted under land use plans is rarely sufficient to make a detailed quantification of effects. Therefore, a precautionary approach has been taken (in the absence of more precise data) assuming as the default position that if a likely significant effect (LSE) cannot be confidently ruled out, then the assessment must be taken to the next level of assessment Task Two: Appropriate Assessment. This is in line with the April 2018 court ruling relating to ‘People Over Wind’ where mitigation and avoidance measures are to be included at the next stage of assessment.

Task Two: Appropriate Assessment

2.13 European Site(s) which have been ‘screened in’ during the previous Task have a detailed assessment undertaken on the effect of the policies on the European site(s) site integrity. Avoidance and mitigation measures to avoid adverse significant effects are taken into account or recommended where necessary.

2.14 As established by case law, ‘appropriate assessment’ is not a technical term; it simply means whatever further assessment is necessary to confirm whether there would be adverse effects on the integrity of any European sites that have not been dismissed at screening. Since it is not a technical term it has no firmly established methodology except that it essentially involves repeating the analysis for the likely significant effects stage, but to a greater level of detail on a smaller number of policies and sites, this time with a view to determining if there would be adverse effects on integrity.

2.15 One of the key considerations during Appropriate Assessment is whether there is available mitigation that would entirely address the potential effect. In practice, the Appropriate Assessment takes any policies or allocations that could not be dismissed following the high-level Screening analysis and analyse the potential for an effect in more detail, with a view to concluding whether there would actually be an adverse effect on integrity (in other words, disruption of the coherent structure and function of the European site(s)).

The Geographic Scope

- 2.16 There is no single guidance document that dictates the physical scope of an HRA of a plan in all circumstances. Therefore, in considering the physical scope of the assessment AECOM was guided primarily by the identified impact pathways rather than by arbitrary “zones”, i.e. a source-pathway-receptor approach. Current guidance suggests that the following European sites be included in the scope of assessment:
- All sites within the borough; and
 - Other sites shown to be linked to development within Test Valley through a known “pathway” (discussed below).
- 2.17 Briefly defined, impact pathways are routes by which a change in activity within the plan area can lead to an effect upon a European site. In terms of the second category of European site listed above, guidance states that the AA should be “*proportionate to the geographical scope of the [plan policy]*” and that “*an AA need not be done in any more detail, or using more resources, than is useful for its purpose*” (MHCLG, 2006, p.6).
- 2.18 Locations of European designated sites are illustrated in **Appendix A, Figure 1**, and full details of all European designated sites discussed in this document can be found in **Appendix B** specifying their qualifying features, conservation objectives and pressures and threats to integrity taken from the Site Improvement Plan for each site, although it is noted that the Conservation Objectives and Supplementary Advice on Conservation Objectives take precedence over Site Improvement Plans as they are generally more recent. Table 1 below lists all those European designated sites included in this HRA.
- 2.19 The Physical scope of this exercise includes all European sites within Table 1 below.

Table 1. Physical scope of the HRA - European sites of interest

European Site	Description	Distance from Test Valley Borough
Mottisfont Bats SAC	Mottisfont Bats SAC is designated for its Annex II population of Barbastelle bats (<i>Barbastella barbastellus</i>) for which this is considered to be one of the best areas in the United Kingdom. It is one of only six known maternity sites in the UK and the only one in Hampshire. Mottisfont contains a mix of woodland types including hazel (<i>Corylus avellana</i>) coppice with standards, broadleaved plantation and coniferous plantation which the bats use for breeding, roosting, commuting and feeding.	Within borough
Emer Bog SAC	Emer Bog SAC is designated for its Annex I habitat of transition mires and quaking bogs for which this is considered to be one of the best areas in the United Kingdom. The bog is largely open and dominated by bottle sedge (<i>Carex rostrata</i>) and marsh cinquefoil (<i>Potentilla palustris</i>), with frequent common cotton grass (<i>Eriophorum angustifolium</i>), and occasional pools with bogbean (<i>Menyanthes trifoliata</i>). The basin is surrounded by more mature willow Salix woodland and open heathland.	Within borough
River Itchen SAC	The River Itchen SAC is designated for Annex I habitats of water courses of plain to montane levels with the Crowfoot (<i>Ranunculion fluitantis</i>) and pond water-starwort (Callitriche-Batrachion) vegetation. Annex II species for primary designation are Southern damselfly (<i>Coenagrion mercuriale</i>) and Bullhead (<i>Cottus gobio</i>), with other qualifying species being white clawed (or Atlantic stream) crayfish (<i>Austropotamobius pallipes</i>), brook lamprey (<i>Lampetra planeri</i>), Atlantic salmon (<i>Salmo salar</i>) and otter (<i>Lutra lutra</i>).	1.7km east of borough

European Site	Description	Distance from Test Valley Borough
The New Forest SAC	<p>The New Forest SAC is designated for Annex I habitats of Oligotrophic waters containing very few minerals of sandy plains (<i>Littorelletalia uniflorae</i>), Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i>, Northern Atlantic wet heaths with <i>Erica tetralix</i>, European dry heaths, molinia meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>), Depressions on peat substrates of the <i>Rhynchosporion</i>, Atlantic acidophilous beech forests with Ilex and sometimes also Taxus in the shrub layer (<i>Quercion robori-petraeae</i> or <i>Illici-Fagenion</i>), Asperulo-Fagetum beech forests, Old acidophilous oak woods with English Oak (<i>Quercus robur</i>) on sandy plains and priority habitats of bog woodland and Alluvial forests.</p> <p>Annex II species for designation are Southern damselfly (<i>Coenagrion mercurial</i>), Stag beetle (<i>Lucanus cervus</i>) and Great crested newt (<i>Triturus cristatus</i>)</p>	Partially within borough (outside plan area)
Salisbury Plain SAC	<p>Salisbury Plain SAC is designated for Annex I habitats of common juniper (<i>Juniperus communis</i>) formations on heaths or calcareous grasslands and semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) which is an important orchid site.</p> <p>Annex II species for designation are Marsh fritillary butterfly (<i>Eurodryas, Hypodryas</i>)</p>	Partially within borough
Salisbury Plain SPA	<p>Salisbury Plain SPA includes the largest expanse of unimproved chalk downland in NW Europe, comprising 41% of Britain's chalk downland. The area has largely not been subject to intensive farming due to use for military training. The site also includes small areas of scrubland and woodland.</p> <p>The Salisbury Plain SPA is designated for its populations of:</p> <ul style="list-style-type: none"> • Hen harrier (<i>Circus cyaneus</i>) (non-breeding) • Eurasian hobby (<i>Falco Subbuteo</i>) (breeding) • Common quail (<i>Coturnix coturnix</i>) (breeding) • Stone-curlew (<i>Burhinus oediconemus</i>) (breeding) 	Partially within borough
Porton Down SPA	<p>Porton Down SPA is designated for its population of breeding Stone-curlew (<i>Burhinus oediconemus</i>) the SPA supports 11 breeding pairs which comprised 10.6% of the GB breeding population.</p>	Partially within borough
New Forest SPA	<p>The New Forest SPA is designated for its populations of:</p> <ul style="list-style-type: none"> • European honey buzzard (<i>pernis apivorus</i>) (breeding) • Hen harrier (<i>Circus cyaneus</i>) (non-breeding) • Eurasian hobby (<i>Falco subbuteo</i>) (breeding) • European nightjar (<i>Caprimulgus europaeus</i>) (breeding) • Woodlark (<i>Lullula arborea</i>) (breeding) • Dartford warbler (<i>Sylvia undata</i>) (breeding) • Wood warbler (<i>Phylloscopus sibilatrix</i>) (breeding) 	Partially within borough (outside plan area)
New Forest Ramsar	<p>The New Forest Ramsar is designated for the following criteria:</p> <p>Ramsar Criterion 1</p> <p>Valley mires and wet heaths are found throughout the site and are of outstanding scientific interest. The mires and heaths are within catchments whose uncultivated and undeveloped state buffer the mires against adverse</p>	Partially within the borough (outside plan area)

European Site	Description	Distance from Test Valley Borough
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	<p>ecological change. This is the largest concentration of intact valley mires of their type in Britain.</p> <p>Ramsar Criterion 2</p> <p>The site supports a diverse assemblage of wetland plants and animals including several nationally rare species. Seven species of nationally rare plants are found on the site, as are at least 65 British Red Data Book species of invertebrates.</p> <p>Ramsar Criterion 3</p> <p>The mire habitats are of high ecological quality and diversity and have undisturbed transition zones. The invertebrate fauna of the site is important due to the concentration of rare and scarce wetland species. The whole site complex, with its examples of semi-natural habitats is essential to the genetic and ecological diversity of southern England.</p>	
Solent and Southampton Water Ramsar	<p>The site comprises of estuaries and adjacent coastal habitats including intertidal flats, saline lagoons, shingle beaches, saltmarsh, reedbeds, damp woodland, and grazing marsh. The diversity of habitats supports internationally important numbers of wintering waterfowl, important breeding gull and tern populations and an important assemblage of rare invertebrates and plants.</p>	Partially within the borough
Solent and Southampton Water SPA	<p>Solent and Southampton Water SPA is designated for:</p> <ul style="list-style-type: none"> • Mediterranean gull (<i>Larus melanocephalus</i>) – 15.4% of the GB breeding population • Little tern (<i>Sternula albifrons</i>) – 2% of the GB breeding population • Roseate tern (<i>Sterna dougallii</i>) – 3.1% of the GB breeding population • Common tern (<i>Sterna hirundo</i>) – 2.2% of the GB breeding population • Sandwich tern (<i>Sterna sandvicensis</i>) – 1.7% of the GB breeding population • Eurasian teal (<i>Anas crecca</i>) – 1.1% of the population (wintering) • Dark-bellied brent goose (<i>Branta bernicla bernicla</i>) – 2.5% of the population (wintering) • Common ringed plover (<i>Charadrius hiaticula</i>) – 1.2% of the population (wintering) • Black-tailed godwit (<i>Limosa limosa islandica</i>) – 1.7% of the population (wintering) <p>Internationally important bird assemblage – regularly supports 51,361 waterfowl in the winter.</p>	Partially within the borough
Solent Maritime SAC	<p>Solent Maritime SAC is designated for Annex I habitats of estuaries, spartina swards, Atlantic salt meadows, sandbanks which are slightly covered by sea water all the time, mudflats and sandflats not covered by seawater at low tide, coastal lagoons, annual vegetation of stoney banks, annual vegetation of drift lines, Salicornia and other annual colonising mud and sand, and shifting dunes along the shoreline with <i>Ammophila arenaria</i> “white dunes”. The site is also designated for the Annex II species desmoulins whorl snail (<i>Vertigo moulinsiana</i>)</p>	Partially within borough
Kennet Valley Alderwoods SAC	<p>Kennet Valley Alderwoods consists of the largest fragments of alder-ash (<i>Alnus glutinosa</i> – <i>Fraxinus excelsior</i>) woodland on the Kennet floodplain.</p>	7.5 km north of borough

European Site	Description	Distance from Test Valley Borough
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	<p>They lie on alluvium overlain by a shallow layer of moderately calcareous peat. The wettest areas are dominated by alder <i>Alnus glutinosa</i> over tall herbs, sedges and reeds, but dryer patches include a base-rich woodland flora with much dog's mercury <i>Mercurialis perennis</i> and also herb-Paris <i>Paris quadrifolia</i>. The occurrence of the latter is unusual, as it is more typically associated with ancient woodland, whereas the evidence suggests that these stands have largely developed over the past century.</p>	
Kennet & Lambourn Floodplain SAC	<p>The Kennet & Lambourn Floodplain SAC consists of a cluster of sites with a chalk stream habitat. These sites are designated for their population of Desmoulin's whorl snail <i>Vertigo moulinsiana</i>. The habitat at this site that is occupied mostly consists of reed sweet-grass <i>Glyceria maxima</i> swamp or tall sedges at the river margins, in ditches and in depressions in wet meadows.</p>	8.5 km north of borough
River Avon SAC	<p>The River Avon SAC is one of the richest chalk rivers in Europe. It is important for its fish population, invertebrate, which include populations of Desmoulin's Whorl Snail and its in-river plant community habitat as well as bankside habitats.</p>	4.8 km west of borough
Solent and Dorset Coast SPA	<p>The Solent and Dorset Coast is designated for breeding sandwich, common and little tern and overlaps with large areas of Solent and Southampton Water SPA and Ramsar and the Solent Maritime SAC. This SPA protects close to 1,000 pairs of terns and spans an area of more than 891 km². This area is particularly important to these birds as much of the sea around their breeding colonies is the ideal habitat for plunge diving for food.</p>	780 m south of borough

The 'in Combination' Scope

- 2.20 It is a requirement of the Regulations that the impacts and effects of any land use plan being assessed are not considered in isolation but in combination with other plans and projects that may also be affecting the European designated site(s) in question.
- 2.21 When undertaking this part of the assessment it is essential to bear in mind the principal intention behind the legislation i.e., to ensure that those projects or plans which in themselves have minor impacts are not simply dismissed on that basis but are evaluated for any cumulative contribution they may make to an overall significant effect. In practice, in combination assessment is therefore of greatest relevance when the plan would otherwise be screened out because its individual contribution is inconsequential. The overall approach is to exclude the risk of there being unassessed likely significant effects in accordance with the precautionary principle. This was first established in the seminal Waddenzee⁶ case.
- 2.22 For the purposes of this HRA, we have determined that the key other documents with a potential for in-combination effects are:
- New Forest Local Plan 2016-2036: Part 1 Planning Strategy Adopted 2020⁷
 - New Forest is also currently working on the emerging Local Plan Part 2 Review⁸
 - Wiltshire Core Strategy Adopted 2015⁹

⁶ Waddenzee case (Case C-127/02, [2004] ECR-I 7405)

⁷ [Local Plan 2016-2036 Part One FINAL.pdf \(newforest.gov.uk\)](#); Accessed 13/04/2023

⁸ [PORTFOLIO: ECONOMY AND PLANNING \(newforest.gov.uk\)](#); Accessed 13/04/2023

⁹ [untitled \(wiltshire.gov.uk\)](#); Accessed 13/04/2023

- Wiltshire is also currently working on an emerging Local Plan Review which went to pre-submission consultation on 27th September 2023¹⁰
- Basingstoke and Deane Local Plan 2011-2029 Adopted 2016¹¹
- Basingstoke and Deane are also currently working on an emerging Local Plan Update¹²
- Eastleigh Local Plan 2016-2036 Adopted 2022¹³
- Southampton City Adopted Development Plans; including City Centre Action Plan, Core Strategy Partial Review, Amended Core Strategy, Amended Local Plan Review, all Adopted 2015¹⁴
- Southampton City is also working on an emerging Local Plan¹⁵
- Winchester Local Plan Part 1: Joint Core Strategy Adopted 2013¹⁶
- Winchester Local Plan Part 2: Development management and Site Allocations Adopted 2017¹⁷
- Winchester is also currently working on an emerging Local Plan¹⁸.

2.23 It should be noted that, the list above is not a definitive list and while the broad potential impacts of these plans will be considered, this document does not carry out a full HRA of these Plans and projects. Instead, it draws upon existing HRAs that have been carried out on the Plans and projects.

¹⁰ [Wiltshire Local Plan Pre-Submission Consultation - Keyplan](#); Accessed 01/12/2023

¹¹ [Adopted Local Plan 2011-2029 \(basingstoke.gov.uk\)](#) Accessed 16/01/2023

¹² [Issues and Options Consultation \(basingstoke.gov.uk\)](#); Accessed 13/04/2023

¹³ [Local Plan | Eastleigh Borough Council](https://www.southoxon.gov.uk/wp-content/uploads/sites/2/2021/02/SODC-LP2035-Publication-Feb-2021.pdf)<https://www.southoxon.gov.uk/wp-content/uploads/sites/2/2021/02/SODC-LP2035-Publication-Feb-2021.pdf> Accessed 16/01/2023

¹⁴ [Adopted development plans \(southampton.gov.uk\)](#) Accessed 16/01/2023

¹⁵ [Draft Plan with Options \(southampton.gov.uk\)](#) Accessed 13/04/2023

¹⁶ [Local Plan - Winchester City Council](#); Accessed 13/04/2023

¹⁷ [LPP2 Adoption - Winchester City Council](#); Accessed 13/03/2023

¹⁸ [Winchester District Local Plan 2018 – 2039 \(Emerging\) - Winchester City Council](#) Accessed 16/01/2023

3. Impact Pathways

- 3.1 In carrying out an HRA it is important to avoid confining oneself to effectively arbitrary boundaries (such as local authority or parish boundaries), but to use an understanding of the various ways in which land use plans can impact European sites to evaluate whether development is connected with European sites, in some cases many kilometres distant. Briefly defined, impact pathways are routes by which a change in activity associated with a development can lead to an effect upon a European site. As highlighted earlier, it is also important to bear in mind MHCLG guidance which states that the AA should be ‘*proportionate to the geographical scope of the [plan policy]*’ and that ‘*an AA need not be done in any more detail, or using more resources, than is useful for its purpose*’ (CLG, 2006, p.6¹⁹).
- 3.2 Based upon Natural England’s Site Improvement Plans (SIPs), consideration of Supplementary Advice on the Conservation Objectives, and professional judgement, the following impact pathways require consideration regarding development proposals within the Test Valley Local Plan area and the identified European sites:
- Recreational pressure;
 - Atmospheric pollution;
 - Water quantity, level and flow;
 - Water quality; and
 - Functionally linked land.

Background to Recreational Pressure

- 3.3 There is growing concern over the cumulative impacts of recreation on key nature conservation sites in the UK, as most sites must fulfil Conservation Objectives while also providing recreational opportunity. Various studies have provided compelling links between increases in housing development and access levels²⁰, and resulting impacts in European sites^{21 22}.
- 3.4 In general, recreational use of a site has the potential to:
- Cause disturbance to sensitive species such as ground-nesting birds and wintering wildfowl;
 - Cause damage through erosion, trampling and fragmentation; and
 - Cause eutrophication due to dog fouling.
- 3.5 Different types of European sites (e.g., heathland, freshwater, chalk grassland) have a range of vulnerabilities and are sensitive to different types of recreational pressures, such as recreational use in the New Forest SAC, a heathland site, can also increase the risk of impacts like fire and contamination. Studies across a range of species have shown that the effects from recreation can be complex.
- 3.6 Types of recreational pressure relevant to the Plan Area are discussed below.

Bird Disturbance

- 3.7 Disturbance effects can have negative impacts on qualifying birds in various ways, with reduced chick provisioning and increased nest predation due to adults being flushed from the nest and deterred from returning. A literature review on the effects of human disturbance on breeding birds found that 36 out of 40 studies reported reduced breeding success due to disturbance²³. The main reasons given for the reduction in breeding success were nest abandonment and increased predation of eggs or young. Studies of other

¹⁹ Department for Communities and Local Government. 2006. *Planning for the Protection of European Sites: Appropriate Assessment*.

²⁰ Weitowitz D.C., Panter C., Hoskin R. & Liley D. 2019. The effect of urban development on visitor numbers to nearby protected nature conservation sites. *Journal of Urban Ecology* 5. <https://doi.org/10.1093/jue/juz019>

²¹ Liley D, Clarke R.T., Mallord J.W., Bullock J.M. (2006a). The effect of urban development and human disturbance on the distribution and abundance of nightjars on the Thames Basin and Dorset Heaths. Natural England / Footprint Ecology.

²² Liley D., Clarke R.T., Underhill-Day J., Tyldesley D.T. (2006b). Evidence to support the appropriate Assessment of development plans and projects in south-east Dorset. Footprint Ecology / Dorset County Council.

²³ Hockin D.M., Oundsted M., Gorman D., Hill V. & Barker M.A. (1992). Examination of the effects of disturbance on birds with reference to its importance in ecological assessments. *Journal of Environmental Management* 36: 253-286.

species have shown that birds nest at lower densities in disturbed areas, particularly when there is weekday as well as weekend pressure²⁴. Recreational disturbance effects on ground-nesting birds are particularly severe, with many studies concluding that urban sites support lower densities of key species, such as stone curlew and nightjar^{25 26}.

- 3.8 Furthermore, there are numerous parameters (e.g. seasonality, type of recreational activity) that may reduce or exacerbate the magnitude of bird disturbance. For example, disturbance in winter may be more impactful because food shortages make birds more vulnerable at this time of year. In contrast, this may be counterbalanced by fewer recreational users in the winter months and lower overall sensitivity of birds outside the breeding season. Evidence in the literature suggests that the magnitude of disturbance clearly differs between different types of recreational activities. For example, dog walking leads to a significantly higher reduction in bird diversity and abundance compared to hiking²⁷. Scientific evidence also suggests that key disturbance parameters, such as areas of influence and flush distance, are significantly greater for dog walkers than hikers²⁸. In addition, dogs, rather than people, tend to be the cause of many management difficulties, notably by worrying grazing animals. A literature review summarised data on the use of semi-natural habitat by dogs²⁹, indicating that the proportion of dog walkers using sensitive sites tends to be high (54%)
- 3.9 Direct evidence for bird disturbance has been collected in many field studies. For example, observations of bird disturbance were undertaken by Footprint Ecology³⁰ in the Solent in 2009/2010. The study focused on recreational disturbance to wintering waterfowl on intertidal habitats along the Solent shoreline, stretching between Hurst Spit (Hampshire) and Chichester Harbour (East Sussex) and included the north shoreline of the Isle of Wight. From 2,507 events (records of visitors in the bird survey areas) occurring within 200m of the birds, 4,064 species-specific observations were noted, which included no response (83% of observations), major flight (8%), minor flight (2%), short evasive walks away from the stimulus (3%) and alertness (4%).
- 3.10 Off lead dogs within the intertidal area accounted for 27% of all major flight observations, and also responsible for over half of all intertidal observations. The report stated that “*activity types were aggregated into simple aggregates: land-based and water-based, and only a selection of bird species were included. The main variable that was consistently related to the response to disturbance was the aggregated activity type. Typically, the responses to dog walking and other land-based activities were of similar magnitude, but less than the responses to water-based activities. Bird body mass was significantly positively related to response distance, providing a means of predicting the response to disturbance of species other than those included in the analyses. Other variables that had a less consistent influence on the response to disturbance included whether or not a disturbing activity occurred on the intertidal, and whether any of the disturbed birds were feeding prior to the disturbance.*”. Inter-species differences in responses to disturbance stimuli are also evident from other studies. For example, one study found that there was a significant negative correlation between the degree of urban development and the number of nightjar territories in Dorset heathland sites, but no such impacts were found for woodlark and Dartford warbler³¹.
- 3.11 However, bird disturbance studies need to be treated with care. For instance, the magnitude of disturbance is not necessarily correlated with the impact of disturbance, i.e., the most easily disturbed species are not necessarily those that will suffer the greatest impacts. For example, it has been shown in some cases, that the most easily disturbed birds simply move to alternative feeding sites, while others remain (likely due to an absence of suitable alternative foraging areas) and thus suffer greater population-level impacts³². A

²⁴ Van der Zande A.N., Berkhuisen J.C., van Letesteijn H.C., ter Keurs W.J. & Poppelaars A.J. (1984). Impact of outdoor recreation on the density of a number of breeding bird species in woods adjacent to urban residential areas. *Biological Conservation* **30**: 1-39.

²⁵ Clarke R.T., Liley D., Sharp J.M. & Green R.E. (2013). Building development and roads: Implications for the distribution of stone curlews across the Brecks. *PLOS ONE*. <https://doi:10.1371/journal.pone.0072984>.

²⁶ Liley D. & Clarke R.T. (2003). The impact of urban development and human disturbance on the numbers of nightjar *Caprimulgus europaeus* on heathlands in Dorset, England. *Biological Conservation* **114**: 219-230.

²⁷ Banks P.B. & Bryant J.Y. (2007). Four-legged friend or foe? Dog walking displaces native birds from natural areas. *Biology Letters* **3**: 14pp.

²⁸ Miller S.G., Knight R.L. & Miller C.K. (2001). Wildlife responses to pedestrians and dogs. *Wildlife Society Bulletin* **29**: 124-132.

²⁹ Ibid.

³⁰ [Solent Bird Report Cover.psd \(solentems.org.uk\)](#); Accessed 01/12/2023

³¹ Liley D. & Clarke R.T. (2002). Urban development adjacent to heathland sites in Dorset: The effect on the density and settlement patterns of Annex I bird species. English Nature Research Reports, No 463. English Nature, Peterborough. 33pp.

³² Gill et al. (2001). Why behavioural responses may not reflect the population consequences of human disturbance. *Biological Conservation* **97**: 265-268.

literature review undertaken for the RSPB³³ also urges caution when extrapolating the results of disturbance studies because responses differ between species and may be impacted by local environmental conditions. This should be considered when predicting the potential impacts of future recreational pressure on European sites.

- 3.12 It should also be emphasised that recreational use is not necessarily a problem. Many European sites are also National Nature Reserves or nature reserves managed by Wildlife Trusts and the RSPB. At some of these sites, access is encouraged, and resources are deployed to ensure that recreational use is managed appropriately. Bird abundances in many of these sites remain stable or, in some cases, are increasing despite high visitor numbers.
- 3.13 In 2015, Wiltshire Council commissioned a visitor study³⁴ which confirmed that the eastern plain of Salisbury Plain does generally have a larger visitor catchment than the central and western plains, with 75% of regular visits to Salisbury Plain SPA originating from within 6.4km. Stone curlew which is a ground nesting species is highly sensitive to recreational disturbance even from several hundred metres distance. Given its specific habitat requirements and sensitivities to disturbance, it has undergone significant declines across the UK largely as a result of changing farming practices, and by the early 1990s the British Stone Curlew population had declined to only 150-160 individuals³⁵. Salisbury Plain remained as one of the core strongholds, while elsewhere the former species range contracted due to conversion of grasslands to arable and increasing mechanisation, and indeed it is now absent from most of its previously known British range.

Trampling Damage

- 3.14 Most terrestrial habitats (including heathland, grassland and woodland) can be affected by trampling and other mechanical damage, which dislodges individual plants, leads to soil compaction and erosion. A general effect of trampling on vegetation is reduced species and structural diversity, since only dominant and tolerant plant species persist³⁶. However, many parameters (e.g. vegetation type, recreational activity, weather and ground conditions) can have marked impacts on the degree of trampling damage. The following provides a brief overview of the impacts of trampling associated with different recreational activities in different habitats:

- A study on experimental trampling of different heathland types under varying weather conditions in Brittany (France) showed that dry heath was more resistant to trampling damage than wet heath³⁷. Equally, both heathland habitats showed greater resilience to trampling under dry than wet conditions.
- Wilson & Seney³⁸ examined the degree of track erosion caused by hikers, motorcyclists, horse riders and cyclists in 108 plots along tracks in the Gallatin National Forest, Montana. Although the results proved difficult to interpret, it was concluded that horses and hikers disturbed more sediment on wet tracks, and therefore caused more erosion, than motorcycles and bicycles.
- Cole et al³⁹ conducted experimental off-track trampling in 18 closed forest, dwarf scrub and meadow & grassland communities (each trampled between 0 – 500 times) over five mountain regions in the US. Vegetation cover was assessed two weeks and one year after trampling, and a negative correlation with trampling intensity was discovered. This relationship was weaker after one year than two weeks, indicating some vegetation recovery. Differences in plant morphology was found to explain more variation in response than soil and topographic factors. Low-growing, mat-forming grasses regained their cover best after two weeks and were considered most resistant to trampling, while tall forbs (non-woody vascular plants other than grasses, sedges, rushes and ferns) were considered least resistant. The cover of hemicryptophytes and geophytes (plants with buds below the soil surface) was heavily reduced after two weeks but had recovered well after one year and as such these were considered

³³ Woodfield & Langston. (2004). Literature review on the impact on bird population of disturbance due to human access on foot. *RSPB Research Report* No. 9.

³⁴ Footprint Ecology (2015) Salisbury Plain Visitor Survey 2015

³⁵ <http://jncc.defra.gov.uk/pdf/UKSPA/UKSPA-A6-58.pdf>

³⁶ Santoro R. et.al. (2012). Effects of Trampling Limitation on Coastal Dune Plant Communities. *Environmental Management* DOI 10.1007/s00267-012-9809-6.

³⁷ Gallet S. & Roze F. (2002). Long-term effects of trampling on Atlantic heathland in Brittany (France): Influence of vegetation type, season and weather conditions. *Biological Conservation* **103**: 267-275.

³⁸ Wilson, J.P. & J.P. Seney. (1994). Erosional impact of hikers, horses, motorcycles and off-road bicycles on mountain trails in Montana. *Mountain Research and Development* **14**:77-88.

³⁹ Cole, D.N. (1995a). Experimental trampling of vegetation. I. Relationship between trampling intensity and vegetation response. *Journal of Applied Ecology* **32**: 203-214

Cole, D.N. (1995b). Experimental trampling of vegetation. II. Predictors of resistance and resilience. *Journal of Applied Ecology* **32**: 215-224

most resilient to trampling. Chamaephytes (plants with buds above the soil surface) were considered least tolerant to regular trampling disturbance.

- Cole⁴⁰ conducted a follow-up study (across four vegetation types) in which shoe type (trainers or walking boots) and trampling weight were varied. Although immediate damage was greater with walking boots, there was no significant difference after one year. Heavier trampers caused a greater reduction in vegetation height than lighter trampers, but there was no differential impact on vegetation cover.
- Cole & Spildie⁴¹ experimentally compared the effects of off-track trampling by hikers and horse riders (at two intensities – 25 and 150 passes) in two woodland vegetation types (one with an erect forb understorey and one with a low shrub understorey). Generally, it was shown that higher trampling intensities caused greater levels of disturbance. Horse trampling resulted in a larger reduction in vegetation cover than hiking. While the forb-dominated vegetation suffered greater disturbance impacts, it recovered rapidly.

3.15 In heathland sites, trampling damage can affect the value of a site to wildlife. For example, heavy use of sandy tracks loosens and continuously disturbs sand particles, reducing the habitat's suitability for invertebrates⁴². Species that burrow into flat surfaces such as the centres of paths, are likely to be particularly vulnerable, as the loose sediment can no longer maintain their burrow. In some instances, nature conservation bodies and local authorities resort to hardening paths to prevent further erosion. However, this is concomitant with the loss of habitat used by wildlife, such as sand lizards and burrowing invertebrates.

3.16 The New Forest SAC is a large and complex ecosystem and one of the largest remaining relatively wild areas in the South of England attracting enormous numbers of visitors each year. The SPA is designated for breeding birds including woodlark, nightjar, and hen harrier. Additionally, the Ramsar is designated for rare mire habitats, plants and invertebrates. Visitor survey work has led to the identification of a 13.8km core catchment for recreational pressure around the SAC/SPA, extending up to 15km for larger developments^{43,44}. It is widely understood that the New Forest is vulnerable to recreational pressure. The Supplementary Conservation Advice states: "*The New Forest attracts high numbers of visitors annually and there is an assumption that disturbance affects the breeding success of SPA birds and SAC habitats through erosion, compaction and damage to vegetation and water bodies.*"

Nutrient Enrichment

3.17 A major concern for nutrient-poor terrestrial habitats such as heathlands is nutrient enrichment associated with dog fouling, which has been addressed in various reviews (e.g., Taylor *et al*⁴⁵). It is estimated that dogs will defecate within 10 minutes of starting a walk and therefore most nutrient enrichment arising from dog faeces will occur within 400m of a site entrance. In contrast, dogs will urinate at frequent intervals during a walk, resulting in a spread-out distribution of urine. For example, in Burnham Beeches National Nature Reserve it is estimated that 30,000 litres of urine and 60 tonnes of dog faeces are deposited annually⁴⁶. While there is little information on the chemical constituents of dog faeces, nitrogen (N) is one of the main components⁴⁷. Nutrient levels are the major determinant of plant community composition and the effect of dog defecation in sensitive habitats is comparable to a high-level application of fertiliser, potentially resulting in the shift to plant communities that are more typical of improved grasslands.

⁴⁰ Cole, D.N. (1995c). Recreational trampling experiments: effects of trampler weight and shoe type. Research Note INT-RN-425. U.S. Forest Service, Intermountain Research Station, Utah.

⁴¹ Cole, D.N., Spildie, D.R. (1998). Hiker, horse and llama trampling effects on native vegetation in Montana, USA. *Journal of Environmental Management* **53**: 61-71

⁴² Taylor K., Anderson P., Liley D. & Underhill-Day J.C. (2006). Promoting positive access management to sites of nature conservation value: A guide to good practice. English Nature / Countryside Agency, Peterborough and Cheltenham.

⁴³ Liley, D., & Caals, Z. (2021). Discussion and analysis relating to the New Forest SAC/SPA/Ramsar and a zone of influence for recreation. Unpublished Report by Footprint Ecology. Retrieved March 23, 2022, from <https://www.testvalley.gov.uk/assets/attach/15276/Recreation-use-of-the-New-Forest-Zone-of-Influence-Footprint-Ecology-2021.pdf>

⁴⁴ Test Valley Borough Council. (2021). New Forest SAC, SPA, and Ramsar - Recreational Pressure Impact Mitigation Zone. Test Valley Borough Council. Retrieved March 23, 2022, from <https://democracy.testvalley.gov.uk/documents/s18073/Draft%20New%20Forest%20International%20Nature%20Conservation%20Designations%20-%20Annex%203.pdf>

⁴⁵ Taylor K., Anderson P., Taylor R.P., Longden K. & Fisher P. (2005). Dogs, access and nature conservation. English Nature Research Report, Peterborough.

⁴⁶ Barnard A. (2003). Getting the facts – Dog walking and visitor number surveys at Burnham Beeches and their implications for the management process. *Countryside Recreation* **11**:16-19.

⁴⁷ Taylor K., Anderson P., Liley D. & Underhill-Day J.C. (2006). Promoting positive access management to sites of nature conservation value: A guide to good practice. English Nature / Countryside Agency, Peterborough and Cheltenham.

3.18 A recent study has published further compelling evidence on the relative impact of N and phosphorus (P) deposition arising from dogs. Using 487 direct-count censuses from four peri-urban forests and nature reserves, the modelling data suggested that canine fertilisation rates amount to 11 kg N and 5 kg P per hectare per year respectively⁴⁸. These amounts are significant when compared to atmospheric nitrogen deposition rates and the offsetting achievable through traditional habitat management techniques (e.g. cutting and removal of hay). The nitrogen deposition by dogs is particularly significant given the nitrogen Critical Load of 5-15 kg N/ha/yr provided for European dry heath and Northern Atlantic wet heath qualifying features of The New Forest SAC on the Air Pollution Information System (APIS). This implies that the minimum CL of a site may be exceeded by N nitrogen deposition from dogs alone, before atmospheric sources are considered. Nutrient availability is the major determinant of plant community composition and the effect of dog defecation in sensitive habitats is comparable to a high-level application of fertiliser, potentially resulting in a shift towards plant communities that are more typical of improved grasslands. The 2020 report by Footprint Ecology⁴⁹ also mentions that urination on the base of trees also affects lower plant communities within the New Forest due to the concentration of ammonia causing toxicity to lichens and mycorrhizal species.

Summary of links to Test Valley Local Plan

3.19 Test Valley Borough Council has been working in partnership with a number of organisations to address the potential for new development to impact on the Solent European sites, New Forest European sites and Salisbury Plain European sites. These European sites have all had core recreational zone buffers identified for where new development is likely to have an impact these are:

- Solent European sites – 5.6 km buffer around the relevant designations including the Solent and Southampton Water SPA
- New Forest European sites – 13.8km buffer with a 15 km buffer for screening larger scale proposals (typically in the order of 150 dwellings or more) around the SAC, SPA and Ramsar
- Salisbury Plain European sites – 6.4 km buffer around the SPA

3.20 Each of the European sites has their own mitigation strategy to set out the approach to providing mitigation in relation to the matter of recreational pressure from new development.

Background to Atmospheric Pollution

3.21 The main pollutants of concern for European sites are oxides of nitrogen (NOx), ammonia (NH₃) and sulphur dioxide (SO₂) and are summarised in Table 2.

Table 2. Main sources and effects of air pollutants on habitats and species.

Pollutant	Source	Effects on habitats and species
Sulphur dioxide (SO ₂)	<p>The main sources of SO₂ are electricity generation, and industrial and domestic fuel combustion. However, total SO₂ emissions in the UK have decreased substantially since the 1980s.</p> <p>Another origin of sulphur dioxide is the shipping industry and high atmospheric concentrations of SO₂ have been documented in busy ports. In future years, shipping is likely to become one of the most important contributors to SO₂ emissions in the UK.</p>	<p>Wet and dry deposition of SO₂ acidifies soils and freshwater and may alter the composition of plant and animal communities.</p> <p>The magnitude of effects depends on levels of deposition, the buffering capacity of soils and the sensitivity of impacted species.</p> <p>However, SO₂ background levels have fallen considerably since the 1980s and are now not regarded a threat to plant communities. For example, decreases in sulphur dioxide concentrations have been linked to returning lichen species and improved tree health in London.</p>
Acid deposition	Leads to acidification of soils and freshwater via atmospheric deposition	Gaseous precursors (e.g., SO ₂) can cause direct damage to sensitive

⁴⁸ De Frenne P., Cougnon M., Janssens G.P.J. & Vangansbeke P. (2022). Nutrient fertilization by dogs in peri-urban ecosystems. *Ecological Solutions and Evidence* 3, <https://doi.org/10.1002/2688-8319.12128>

⁴⁹ https://testvalley.gov.uk/assets/attach/10040/New-Forest-RecreationImpact_Mitigation-Report.pdf; Accessed 01/12/2023

Pollutant	Source	Effects on habitats and species
	<p>of SO₂, NO_x, ammonia and hydrochloric acid. Acid deposition from rain has declined by 85% in the last 20 years, which most of this contributed by lower sulphate levels.</p> <p>Although future trends in sulphate emissions and subsequent deposition to terrestrial and aquatic ecosystems will continue to decline, increased nitrogen emissions may cancel out any gains produced by reduced sulphate levels.</p>	<p>vegetation, such as lichen, upon deposition.</p> <p>Can affect habitats and species through both wet (acid rain) and dry deposition. The effects of acidification include lowering of soil pH, leaf chlorosis, reduced decomposition rates, and compromised reproduction in birds / plants.</p> <p>Not all sites are equally susceptible to acidification. This varies depending on soil type, bed rock geology, weathering rate and buffering capacity. For example, sites with an underlying geology of granite, gneiss and quartz rich rocks tend to be more susceptible.</p>
Ammonia (NH ₃)	<p>Ammonia is a reactive, soluble alkaline gas that is released following decomposition and volatilisation of animal wastes and from some chemical processes and vehicle exhausts. It is a naturally occurring trace gas, but ammonia concentrations are directly related to the distribution of livestock.</p> <p>Ammonia reacts with acid pollutants such as the products of SO₂ and NO_x emissions to produce fine ammonium (NH₄⁺) - containing aerosol. Due to its significantly longer lifetime, NH₄⁺ may be transferred much longer distances (and can therefore be a significant trans-boundary issue).</p> <p>While ammonia deposition may be estimated from its atmospheric concentration, the deposition rates are strongly influenced by meteorology and ecosystem type.</p>	<p>The negative effect of NH₄⁺ may occur via direct toxicity when uptake exceeds detoxification capacity and via nitrogen accumulation.</p> <p>Its main adverse effect is eutrophication, leading to species assemblages that are dominated by fast-growing and tall species. For example, a shift in dominance from heath species (lichens, mosses) to grasses is often seen.</p> <p>As emissions mostly occur at ground level in the rural environment and NH₃ is rapidly deposited, some of the most acute problems of NH₃ deposition are for small relict nature reserves located in intensive agricultural landscapes.</p>
Nitrogen oxides (NO _x)	<p>Nitrogen oxides are mostly produced in combustion processes. Half of NO_x emissions in the UK derive from motor vehicles, one quarter from power stations and the rest from other industrial and domestic combustion processes.</p>	<p>Direct toxicity effects of gaseous nitrates are likely to be important in areas close to the source (e.g., roadside verges). A critical level of NO_x for all vegetation types has been set to 30 ug/m³.</p> <p>Deposition of nitrogen compounds (nitrates (NO₃), nitrogen dioxide (NO₂) and nitric acid (HNO₃)) contributes to the total nitrogen deposition and may lead to both soil and freshwater acidification.</p> <p>In addition, NO_x contributes to the eutrophication of soils and water, altering the species composition of plant communities at the expense of sensitive species.</p>
Nitrogen deposition	<p>The pollutants that contribute to the total nitrogen deposition derive mainly from oxidized (e.g., NO_x) or reduced (e.g. NH₃) nitrogen emissions (described separately above). While oxidized nitrogen mainly originates from major</p>	<p>All plants require nitrogen compounds to grow, but too much overall nitrogen is regarded as the major driver of biodiversity change globally.</p>

Pollutant	Source	Effects on habitats and species
	<p>conurbations or highways, reduced nitrogen mostly derives from farming practices.</p> <p>The nitrogen pollutants together are a large contributor to acidification (see above).</p>	<p>Species-rich plant communities with high proportions of slow-growing perennial species and bryophytes are most at risk from nitrogen eutrophication. This is because many semi-natural plants cannot assimilate the surplus nitrogen as well as many graminoid (grass) species.</p> <p>Nitrogen deposition can also increase the risk of damage from abiotic factors, e.g., drought and frost.</p>
Ozone (O ₃)	<p>A secondary pollutant generated by photochemical reactions involving NO_x, volatile organic compounds (VOCs) and sunlight. These precursors are mainly released by the combustion of fossil fuels (as discussed above).</p> <p>Increasing anthropogenic emissions of ozone precursors in the UK have led to an increased number of days when ozone levels rise above 40 parts per billion (ppb) ('episodes' or 'smog'). Reducing ozone pollution is believed to require action at international level to reduce levels of the precursors that form ozone.</p>	<p>Concentrations of O₃ above 40 ppb can be toxic to both humans and wildlife and can affect buildings.</p> <p>High O₃ concentrations are widely documented to cause damage to vegetation, including visible leaf damage, reduction in floral biomass, reduction in crop yield (e.g. cereal grains, tomato, potato), reduction in the number of flowers, decrease in forest production and altered species composition in semi-natural plant communities.</p>

Source: Information summarised from the Air Pollution Information System (<http://www.apis.ac.uk/>)

- 3.22 SO₂ emissions are overwhelmingly influenced by the output of power stations and industrial processes that require the combustion of coal and oil. As such, it is unlikely that material increases in SO₂ emissions will be associated with the Test Valley Local Plan. NH₃ emissions are dominated by agriculture, with some chemical processes also making notable contributions.
- 3.23 NH₃ can have a directly toxic effect upon vegetation, particularly at close distances to the source such as near road verges⁵⁰. NO_x can also be toxic at high concentrations (far above the annual average Critical Level) but generally only in the presence of elevated SO₂ which is very rare in the UK.
- 3.24 NO_x emissions, however, are dominated by the output of vehicle exhausts (more than half of all emissions). Within a 'typical' housing development, by far the largest contribution to NO_x (92%) will be made by the associated road traffic. Other sources, although relevant, are of minor importance (8%) in comparison⁵¹. Emissions of NO_x could therefore be reasonably expected to increase as a result of greater vehicle use due to the Test Valley Local Plan. High levels of NO_x and NH₃ are likely to increase the total nitrogen deposition to soils, potentially leading to deleterious knock-on effects in resident ecosystems. Increases in nitrogen deposition from the atmosphere can, if sufficiently great, enhance soil fertility and lead to eutrophication. This often has adverse effects on community composition and the quality of semi-natural, nitrogen-limited terrestrial and aquatic habitats^{52, 53}.
- 3.25 According to the World Health Organisation, the critical NO_x concentration (critical threshold) for the protection of vegetation is 30 µgm⁻³. In addition, ecological studies have determined 'Critical Loads' (CLs)⁵⁴ of atmospheric nitrogen deposition (that is, NO_x combined with ammonia NH₃) for key habitats within European sites.

⁵⁰ http://www.apis.ac.uk/overview/pollutants/overview_NOx.htm.

⁵¹ Proportions calculated based upon data presented in Dore CJ et al. 2005. UK Emissions of Air Pollutants 1970 – 2003. UK National Atmospheric Emissions Inventory. <http://www.airquality.co.uk/archive/index.php>

⁵² Wolseley, P. A.; James, P. W.; Theobald, M. R.; Sutton, M. A. **2006**. Detecting changes in epiphytic lichen communities at sites affected by atmospheric ammonia from agricultural sources. *Lichenologist* 38: 161-176

⁵³ Dijk, N. **2011**. Dry deposition of ammonia gas drives species change faster than wet deposition of ammonium ions: evidence from a long-term field manipulation *Global Change Biology* 17: 3589-3607

⁵⁴ The critical load is the rate of deposition beyond which research indicates that adverse effects can reasonably be expected to occur

3.26 According to the Department of Transport's Transport Analysis Guidance, "Beyond 200m, the contribution of vehicle emissions from the roadside to local pollution levels *is not significant*"⁵⁵ (see Figure 1).

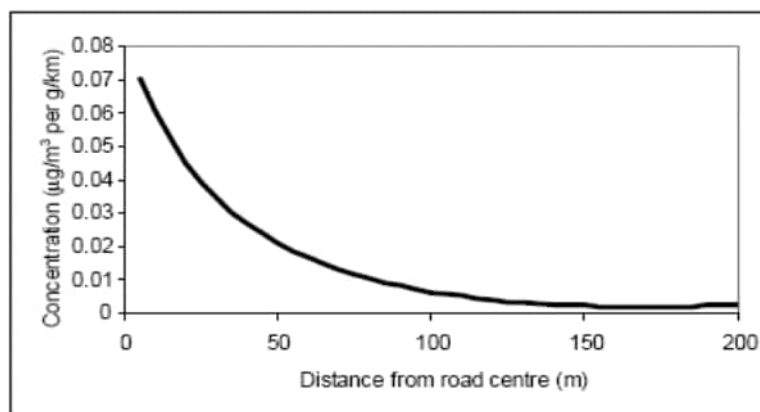


Figure 1: Traffic contribution to concentrations of pollutants at different distances from a road (Source: [TAG unit A3 environmental impact appraisal \(publishing.service.gov.uk\)](https://www.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/424822/tag-unit-a3-environmental-impact-appraisal.pdf))

Summary of links to Test Valley Local Plan

3.27 There are several European sites within or partially within the borough that are sensitive to nitrogen deposition from vehicle emissions. As discussed above, nitrogen deposition occurs within 200m of the road and therefore designated sites within 200m of a main road with sensitive habitats could be affected, these include Solent Maritime SAC, Salisbury Plain SAC and New Forest SAC and Ramsar.

Background to Water Quantity, Level and Flow

3.28 The water level, flow rates and the mixing conditions are important determinants of the condition of European sites and their qualifying features. Hydrological processes are critical in influencing habitat characteristics in rivers, wetlands and for water-dependent plant species. Habitat parameters that may be impacted include water cycling, water depth, dissolved oxygen levels, salinity, current velocity, and water temperature (noting that not all parameters will be relevant to all qualifying habitats / species). In turn these parameters determine the short- and long-term condition, viability and reproductive success of plant and animal species, as well as overall ecosystem composition.

3.29 The unique nature of wetlands combines shallow water and conditions that are ideal for the growth of organisms at the basal level of food webs, which feed many species of birds, mammals, fish and amphibians. Migrating and breeding wetland species are particularly reliant on these food sources, as they need to build up enough nutritional reserves to sustain their long migration routes or feed their hatched chicks.

3.30 Maintaining a steady water supply is of critical importance for many hydrologically dependent SPAs, SACs and Ramsar sites. For example, in many wetlands winter flooding is essential in sustaining a mosaic of foraging habitats for SPA / Ramsar wader and waterfowl species. However, species have varying requirements with regard to specific water levels. For example, some duck species (e.g., wigeon) have optimum water depth requirements of under 0.3m for successful foraging. In contrast, Bewick's swan requires deeper water to enable their natural roosting and loafing behaviours.

3.31 A constant supply of freshwater is fundamental in maintaining the ecological integrity of water-dependent European sites. While the natural fluctuation of water levels within narrow limits is desirable (and indeed often the reason why nature conservation interests are present in a site), excess or too little water supply might cause the water level to be outside of the required range of qualifying birds, invertebrates or plant species. There are two mechanisms through which development can negatively impact the water level in European sites:

- The supply of new housing with potable water may require increased abstraction of water from surface water and groundwater bodies. Depending on the level of water stress in a geographic region, this may reduce the water levels in European sites that lie in the same catchment as new abstractions.

⁵⁵ [TAG unit A3 environmental impact appraisal \(publishing.service.gov.uk\)](https://www.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/424822/tag-unit-a3-environmental-impact-appraisal.pdf)

- The proliferation of impermeable surfaces increases the volume and speed of surface water runoff. As traditional drainage systems often cannot cope with the volume of stormwater, Combined Sewer Overflows (CSOs) are designed to discharge excess water directly into watercourses to protect human assets. Such pluvial flooding may result in downstream inundation of watercourses and flooding in wetland habitats.
 - Additionally relating specifically to Emer Bog within the Test Valley Plan Area, development can result in changes to infiltration rates, amount of flow, direction or path of flow. The SAC has a relatively small catchment area. Previous studies have shown that the various seasonal flow-ways within the Emer Bog sub-catchment do not necessarily flow directly into Emer Bog, but rather that the flows are intercepted by a series of boundary drains that redirect water around and into the site⁵⁶. Changing land use within this catchment may adversely affect the drainage systems that flow into Emer Bog.
- 3.32 It is noted that Test Valley sits within an area of serious water stress (see Figure 2). This means that the water resources are being or are likely to be exploited to a degree which may result in pressure on the environment or water supplies both now and in the future. This result does not indicate how the individual water companies are performing in the management of their water resources, or a level of risk to public water supply. This may imply that additional abstractions could have negative impacts on water-dependent European sites.
- 3.33 Southern Water is the water supply company for the majority of the borough, with smaller areas served by other companies including Wessex Water and Bournemouth Water. There are also parts of the borough that are off-mains, served by private supplies or abstractions. Extreme weather events and growing population has put strain on two of the main supplies of water within the Test Valley Plan Area. This is due to limits on abstraction from the River Test and River Itchen to protect the ecosystems of the two rivers during droughts⁵⁷.

⁵⁶ <https://testvalley.gov.uk/assets/attach/5218/Emer-Bog-and-Baddesley-Common-Hydrological-Desk-Study-The-Environmental-Project-Consulting-Group-2017.pdf>; Accessed 01/12/2023.

⁵⁷ [signed-sws-and-ea-section-20-operating-agreement-dated-290318.pdf \(southernwater.co.uk\)](https://www.southernwater.co.uk/signed-sws-and-ea-section-20-operating-agreement-dated-290318.pdf); Accessed 01/12/2023

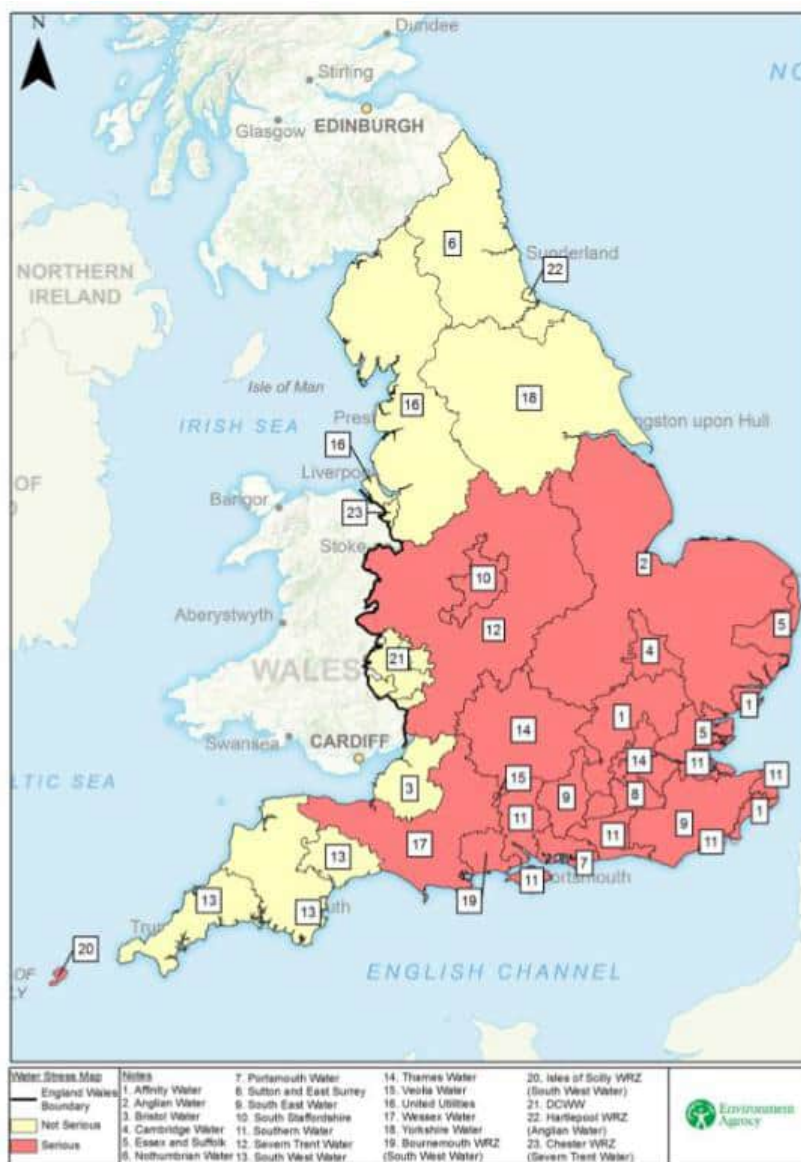


Figure 2: Areas of water stress in England and Wales⁵⁸

Summary of links to Test Valley Local Plan

3.34 Southern Water is the water supply company for the majority of the borough, with smaller areas served by other companies including Wessex Water and Bournemouth Water. There are also parts of the borough that are off-mains, served by private supplies or abstractions. The borough is in an area of high water stress meaning that at peak time there is potentially not enough supply for the demand. Existing abstractions rates are already noted to have a risk of potential issues on the River Itchen SAC. Any further development within the borough requiring abstraction could increase further adverse impacts on the sensitive rivers such as the Itchen and the Test and adversely impact the integrity of the River Itchen SAC. Additionally, Emer Bog SAC has a relatively small hydrological catchment, however, development within this catchment has the potential to disrupt the quantity level and infiltration rates, amount of flow, direction or path of flow of water reaching the SAC.

Background to Water Quality

3.35 Increased amounts of development can lead to reduced water quality of rivers and estuarine environments, as well as other wetlands and water environments. Sewage and industrial effluent discharges, as well as direct and indirect run off can contribute to increased nutrients and toxic contaminants in European sites leading to unfavourable conditions.

⁵⁸ Environment Agency, 2021. Water Stressed Areas – Final Classification 2021. [Water stressed areas final classification 2021.odt \(live.com\)](#) [Accessed 14/02/2023]

3.36 The quality of the water that feeds European sites is an important determinant of the nature of their habitats and the species they support. Poor water quality can have a range of environmental impacts:

- At high levels, toxic chemicals and metals can result in immediate death of aquatic life, and can have detrimental effects even at lower levels, including increased vulnerability to disease and changes in wildlife behaviour.
- Nutrient pollution in water can have adverse environmental impacts. Eutrophication, the enrichment of plant nutrients in water, increases plant growth and consequently results in oxygen depletion. Algal blooms, which commonly result from eutrophication, increase turbidity and decrease light penetration. The decomposition of organic wastes that often accompanies eutrophication deoxygenates water further, augmenting the oxygen depleting effects of eutrophication. These potential impacts have been acknowledged by Natural England in documents such as the Nutrient Neutrality summary guide⁵⁹. In the marine environment, nitrogen is the limiting plant nutrient and so eutrophication is associated with discharges containing available nitrogen. Within the freshwater environments relating to the River Itchen SAC and River Avon SAC, phosphorous is the limiting plant nutrient and so eutrophication in the riverine environment is associated with discharges containing phosphorous. Much of the borough falls within the Solent nitrogen catchment which associated with the River Test and River Itchen. Nutrient Budget Calculator guidance documents for River Avon SAC⁶⁰, River Itchen SAC⁶¹ and the Solent European Sites⁶² detail environmental receptors that be impacted by nutrient pollution. Additionally for phosphorus, areas draining to the Chickenhall Wastewater Treatment Works (WwTW) are also included, which cover Valley Park, and the Hocombe area of Ampfield.
- Some pesticides, industrial chemicals, and components of sewage effluent, and run off, are suspected to interfere with the functioning of the endocrine system, possibly having negative effects on the reproduction and development of aquatic life. Any development within the catchment for Emer Bog SAC could have adverse effects on the SAC through both eutrophication and through damaging chemicals and compounds within run off.
- For sewage treatment works close to capacity, further development may increase the risk of effluent escape into aquatic environments. In some urban areas, sewage treatment and surface water drainage systems are combined, and therefore a predicted increase in flood and storm events could increase pollution risk.

Summary of links to Test Valley Local Plan

3.37 The Solent European sites are vulnerable to nutrient nitrogen input. Increased nutrients from the Solent catchments has led to the development of algal mats which are not broken up due to the low wave action within the Solent, through the protection from the Atlantic Ocean offered by the location of the Isle of Wight. These mats can damage habitats and restrict bird feeding causing higher mortality rates. Natural England has introduced a requirement for any new overnight accommodation which is located in catchments draining into the Solent to be “nutrient neutral”. This means that developments must find ways to mitigate urban runoff and sewage treatment for the development’s lifecycle (usually 80-130 years depending on authority)⁶³. This is to prevent further damage to the protected sites.

3.38 Similar impacts have also been seen in the River Itchen SAC and River Avon SAC, which also require nutrient neutral development within their respective catchments. Both phosphorus (for wastewater element only) and nitrogen are required for areas which discharge into the Chickenhall Wastewater Treatment Works which discharges to the River Itchen and covers Valley Park and the Hocombe area of Ampfield. The area of the borough which wastewater will drain into the River Avon surrounds the Shipton Bellinger and Cholderton areas.

3.39 Test Valley Borough Council has been working in partnership with a number of organisations on a catchment basis in relation to nutrient neutrality matters and seeking to identify options for mitigation. This includes through the Partnership for South Hampshire to address the potential for new development to impact on the Solent European sites.

⁵⁹ Natural England, Defra, and DLUHC (2022) Nutrient Neutrality and Nutrient Mitigation (updated 2023) <https://publications.naturalengland.org.uk/file/5468916693073920> [Accessed 05/01/2024]

⁶⁰ <https://www.testvalley.gov.uk/assets/attach/16090/River-Avon-Nutrient-Budget-Calculator-Guidance-Document.pdf>

⁶¹ <https://www.testvalley.gov.uk/assets/attach/16131/River-Itchen-Nutrient-Budget-Calculator-Guidance-Document.pdf>

⁶² <https://www.testvalley.gov.uk/assets/attach/16093/Solent-Nutrient-Budget-Calculator-Guidance.pdf>

⁶³ [Nutrient Mitigation for New Housing Development - Partnership for South Hampshire \(push.gov.uk\)](#) [Accessed 19/04/2023]

- 3.40 Additionally, any development within the hydrological catchment of Emer Bog SAC may have adverse effects on the SAC both through eutrophication and through damaging chemicals and compounds associated with run off from developments.

Loss of Functionally Linked Habitat

- 3.41 While most European sites have been geographically defined in order to encompass the key features that are necessary for coherence of their structure and function, this is not the case for all such sites. Due to the highly mobile nature of waterfowl and bats, it is inevitable that areas of habitat of crucial importance to the maintenance of their populations are outside the physical limits of the European site for which they are an interest feature. However, this area will still be essential for maintenance of the structure and function of the interest feature for which the site was designated and land use plans that may affect this land should still therefore be subject to further assessment. This has been underlined by a recent European Court of Justice ruling (C-461/17, known as the Holohan ruling⁶⁴) which in paragraphs 37 to 40 confirms the need for an appropriate assessment to consider the implications of a plan or project on habitats and species outside the European site boundary provided that those implications are liable to affect the conservation objectives of the site.

Bat Sites

- 3.42 For Mottisfont Bats SAC, issues relating to loss of habitat, disturbance to and deteriorating habitats has been identified as a potential threat to the SAC and its qualifying bat species. The qualifying bat species use functionally linked land surrounding to forage, commute and use for seasonal migration into the wider countryside. The area of greatest bat activity surrounding a roost is defined as the Core Sustenance Zone (CSZ)⁶⁵. This term refers to the area surrounding a communal bat roost within which habitat availability and quality will have a significant influence on the resilience and conservation status of the colony using the roost. Mottisfont Bats SAC is a mixed woodland located within the Test Valley Borough. Barbastelle bat, which is the qualifying feature of the SAC designation, has a typical core sustenance zone of 6km around the designated sites in which they have their maternity colonies⁶⁶. However, local evidence⁶⁷ justifies a requirement for a core sustenance zone of 7.5km around Mottisfont Bats SAC. As such, areas within this distance could have potential as functionally linked land. As a rule of thumb functionally linked land is usually considered significant where the parcel of land is considered part of a critical flyway or foraging area for the SAC designated species⁶⁸. The size of development likely to have adverse effects on the SAC will vary depending on their proximity to sensitive habitats and the scale of impact they are likely to have. A small development in a sensitive location may have greater impact than a much larger one a long distance from sensitive habitats. As a general rule, any loss or damage of open water, riparian, deciduous woodland, unimproved grassland and mosaics of these habitats should not be permitted unless there is sufficient offsetting measures incorporated into the plan or project to fully mitigate such losses⁶⁷.

Avian Sites

- 3.43 In general for avian sites, Natural England Impact Risk Zones for each SSSI and guidance that underlies those zones will be utilised. The main document of reference is:
- Natural England (2019). Impact Risk Zones Guidance Summary Sites of Special Scientific Interest Notified for Birds. Version 1.1
- 3.44 This identifies the typical distances that wintering waterfowl will travel from their SPAs to forage. Relevant Impact Risk Zones are identified as follows:

⁶⁴ The Holohan ruling also requires all the interest features of the European sites discussed to be catalogued (i.e. listed) in the HRA. That is the purpose of Appendix B.

⁶⁵ BCT (2020) Core Sustenance Zones and habitats of importance for designing Biodiversity Net Gain for bats. Bat Conservation Trust, London. <https://www.bats.org.uk/resources/guidance-for-professionals/bat-species-core-sustenance-zones-and-habitats-for-biodiversity-net-gain> [Accessed on the 29/03/23]

⁶⁶ https://cdn.bats.org.uk/uploads/pdf/Resources/Core_Sustenance_Zones_Explained_04.02.16.pdf?v=1550597495

⁶⁷ Jonathan Cox Associates, 2010. Mottisfont Bats Special Area of Conservation Protocol for Planning Officers Report to Natural England

⁶⁸ <https://publications.naturalengland.org.uk/file/6572958821646336> [Accessed 19/03/2023]

Table 3. Natural England Impact Risk Zones for Designated Bird Features

Assemblage	Impact Risk Zone (foraging distance)
Wintering birds (except wintering waders and grazing wildfowl; wigeon and geese)	Up to 500m
Dabbling ducks such as teal, mallard and gadwall	Home ranges could extend beyond site boundaries at coastal sites, but less likely to do so at inland water bodies.
Wintering waders (except golden plover and lapwing), brent goose & wigeon (and breeding nightjar)	Maximum foraging distance is 2km
Wintering lapwing and golden plover	Maximum foraging distance is 15-20km. Golden plover can forage up to 15km from a roost site within a protected site. Lapwing can also forage similar distances. Both species use lowland farmland in winter and it is difficult to distinguish between designated populations and those present within the wider environment. Developments affecting functionally linked land more than 10km from the site are unlikely to impact significantly on designated populations.
Wintering white-fronted goose, greylag goose, Bewick's swan, whooper swan & wintering bean goose	Maximum foraging distance is 10km. A bespoke functional land IRZ has replaced the individual Birds 6/7 IRZs for sites supporting the following goose and swan species: pink-footed geese, barnacle goose, Bewick's swan, white-fronted goose and whooper swan. The IRZ is based on GIS distribution records of feeding pink-footed geese from a study undertaken for Natural England by the Wildfowl & Wetlands Trust and the results of work undertaken by the British Trust for Ornithology to identify functionally connected habitat used by barnacle goose, Bewick's swan, white-fronted goose and whooper swan based on WeBS site and BirdTrack data and focuses on only the areas of land that we know are being used as functional habitat by designated populations

3.45 The aforementioned Natural England document further identifies that for SSSIs designated for wintering waterfowl and waders (other than golden plover and lapwing) a maximum of 2km is appropriate for the identification of potential functionally-linked land for development with the exception of wind energy (3km) and airports (10km).

3.46 Additionally, the other document of note with regards to functionally linked land in the Solent, which will be taken into consideration in this HRA is:

- Solent Waders and Brent Goose Strategy published by the Solent Waders and Brent Geese Strategy Steering Group in 2020⁶⁹. The areas of the Solent functionally linked to the waders and brent geese designated in the SPAs are mapped on the Solent Waders and Brent goose network website⁷⁰

Summary of links to Test Valley Local Plan

3.47 Solent and Southampton Water SPA and Ramsar are designated for, breeding sandwich tern, roseate tern, common tern and little tern. It is also designated for non-breeding dark-bellied brent goose, Eurasian teal, ringed plover and black-tailed godwit as well as its non-breeding waterfowl assemblage, but the Regulation 33 advice does not mention either golden plover or lapwing in the list of assemblage species. Therefore, it is reasonable (and precautionary) to use 2km as a zone of influence for this impact pathway. However, much of the land functionally linked to the Solent SPA and Ramsar have been mapped through the Solent Waters and Brent Goose Network⁷¹ and is managed and mitigated through the Solent Waders and Brent Goose Strategy⁷² where development is likely to impact these areas. For the New Forest European Sites breeding nightjar can forage up to 2km outside of the SPA/Ramsar.

3.48 Mottisfont Bats SAC is designated for maternity colonies of barbastelle (*Barbastella barbastellus*). Barbastelle bats, in general, have a core sustenance zone (the zone in which they regularly forage to sustain

⁶⁹ [solent-waders-brent-geese-strategy-2020.pdf \(wordpress.com\)](#); Accessed 01/12/2023.

⁷⁰ [The Solent Waders & Brent Goose Network \(arcgis.com\)](#); accessed 01/12/2023

⁷¹ [The Solent Waders & Brent Goose Network \(arcgis.com\)](#) [Accessed 19/04/2023]

⁷² [solent-waders-brent-geese-strategy-2020.pdf \(wordpress.com\)](#) [Accessed 19/04/2023]

the population) of 6 km, however, local evidence suggests a zone of 7.5 km is appropriate for Mottisfont Bats SAC.

Summary of Impact Pathways to be Taken Forward

3.49 Having considered the impact pathways identified in this chapter, those listed in Table 4 will be taken to the next stage in the HRA process, the LSEs screening.

Table 4. Impact pathways and relevant European sites.

Impact pathway	European site (s) potentially affected
Recreational pressure	<ul style="list-style-type: none"> • New Forest SAC, SPA and Ramsar • Solent and Southampton Water SPA and Ramsar, Solent Maritime SAC and Solent and Dorset Coast SPA • Salisbury Plain SAC and SPA
Functionally Linked Land	<ul style="list-style-type: none"> • Mottisfont Bats SAC • Solent and Southampton Water SPA and Ramsar • New Forest SPA and Ramsar
Air pollution	<ul style="list-style-type: none"> • New Forest SAC and Ramsar • Solent and Southampton Water Ramsar, Solent Maritime SAC • Salisbury Plain SAC • Emer Bog SAC • Mottisfont Bats SAC
Water quantity, level and flow	<ul style="list-style-type: none"> • Emer Bog SAC • River Itchen SAC
Water quality	<ul style="list-style-type: none"> • Solent and Southampton Water SPA and Ramsar, Solent Maritime SAC and Solent and Dorset Coast SPA • Emer Bog SAC • River Itchen SAC • River Avon SAC

Summary of European sites not Taken Forward

3.50 Having considered the impact pathways identified in this chapter, those listed in Table 5 will not be taken forward to the next stage of the HRA process, the LSE screening. The reasons are identified in the table.

Table 5. Impact pathways and relevant European sites not taken forward.

European site	Description of reason not to take forward
Kennet & Lambourn Floodplain SAC	This SAC is vulnerable to water pollution and water quantity level and flow impacts. However, the catchment basin is the Kennet and Pang connected to the Thames River, rather than the Avon, Test or Itchen which run through the borough. Additionally, the catchment for the SAC is managed by Thames Water, therefore additional housing within the borough is unlikely to affect water

	quality or quantity level and flow in the Thames catchment. Therefore, this European Site has no linking impact pathways.
Kennet Valley Alderwoods SAC	This SAC is vulnerable to water quantity level and flow impacts. However, the catchment basin is the Kennet and Pang connected to the Thames River, rather than those which run through the borough. Additionally, the catchment for the SAC is managed by Thames Water, therefore additional housing within the borough is unlikely to affect water quality or quantity level and flow in the Thames catchment. Therefore, this European Site has no linking impact pathways.
Porton Down SPA	Porton Down SPA is not accessible to the public due to being Ministry Of Defence land and therefore there is no recreational pressure. Functionally linked land is not an issue with Porton Down SPA as the stone curlew that are part of the designation for the SPA only nest in specific areas set aside for them within the SPA. Stone curlew themselves are not vulnerable to nitrogen deposition, however, where areas of Porton Down SPA overlap with Salisbury Plain SAC any impact on those habitats will be covered within discussion around Salisbury Plain SAC. With regards to functionally linked land the closest allocation site is over 4.5 km from Porton Down. The stone curlew population of Porton Down SPA only nest within man-made stone curlew plots which are not present within this land parcel and therefore the allocation is not functionally linked to Porton Down SPA. Developments close to Salisbury Plain (Shipton Bellinger and Ludgershall) also do not have any stone curlew plots present within the allocations and therefore functionally linked land can also be ruled out for Salisbury Plain SPA. Therefore, this European site has no linking impact pathways.

4. Test of Likely Significant Effects

- 4.1 This section of the report sets out the Test of Likely Significant Effects, determining whether there is any potential for a significant effect on European sites either alone or 'in combination' with other plans and projects. The potential impact pathways explored, and discussed in detail later in the report, are recreational pressure, loss of functionally linked land, water quantity, level and flow, water pollution - nutrient neutrality and air quality. Proposed allocations for development are considered first, followed by an assessment of all the policies in the Local Plan.

Allocations in the Local Plan 2040

- 4.2 Table 6 overleaf set out each proposed site allocation in the Test Valley Local Plan. For each site, a judgment is made in the last column of the table as to whether it could present any conceivable impact pathway to European sites. The orange colouration shows which site allocations have a conceivable impact pathway to European sites.

Table 6. New Strategic Housing and Commercial Site Allocations in Test Valley Local Plan

Site Reference (SHELAA Ref)	Site Address	Proposed Approximate Capacity (Residential/Commercial)	Potential Likely Significant Effects
76, 203, 258, 404, 441 [Policy NA5]	Land South of London Road, Picket Twenty	90 dwellings	<p>This site is screened in due to the potential for likely significant effects on European sites through the following impacts:</p> <ul style="list-style-type: none"> - Nutrient neutrality in-combination on the Solent European sites - Air quality in-combination on the New Forest SAC and Ramsar, Emer Bog SAC, Mottisfont Bats SAC, Solent and Southampton Water Ramsar, Solent Maritime SAC and the Salisbury Plain SAC - Water quantity level and flow in-combination on the River Itchen SAC (abstraction) <p>The site sits within the River Test catchment. Therefore, no connecting impact pathway to River Itchen or River Avon SAC with regards to nutrient neutrality.</p>
167, 419 [Policy NA7]	Land at Bere Hill, South Andover	1400 dwellings	<p>This site is screened in due to the potential for likely significant effects on European sites through the following impacts:</p> <ul style="list-style-type: none"> - Nutrient neutrality in-combination on the Solent European sites - Air quality in-combination on the New Forest SAC and Ramsar, Emer Bog SAC, Mottisfont Bats SAC, Solent and Southampton Water Ramsar, Solent Maritime SAC and the Salisbury Plain SAC - Water quantity level and flow in-combination on the River Itchen SAC (abstraction) <p>The site sits within the River Test catchment. Therefore, no connecting impact pathway to River Itchen or River Avon SAC with regards to nutrient neutrality.</p>
173 [Policy NA6]	Land at Manor Farm, North of Saxon Way, North Andover	800 dwellings and 1.5ha employment space	<p>This site is screened in due to the potential for likely significant effects on European sites through the following impacts:</p> <ul style="list-style-type: none"> - Nutrient neutrality in-combination on the Solent European sites

Site Reference (SHELAA Ref)	Site Address	Proposed Approximate Capacity (Residential/Commercial)	Potential Likely Significant Effects
			<ul style="list-style-type: none"> - Air quality in-combination on the New Forest SAC and Ramsar, Emer Bog SAC, Mottisfont Bats SAC, Solent and Southampton Water Ramsar, Solent Maritime SAC and the Salisbury Plain SAC - Water quantity level and flow in-combination on the River Itchen SAC (abstraction) <p>The site sits within the River Test Catchment. Therefore, no connecting impact pathway to River Itchen or River Avon SAC with regards to nutrient neutrality.</p>
61 [Policy NA8]	Land east of Ludgershall	350 dwellings	<p>This site is screened in due to the potential for likely significant effects on European sites through the following impacts:</p> <ul style="list-style-type: none"> - Nutrient neutrality in-combination on the Solent European sites - Air quality in-combination on the New Forest SAC and Ramsar, Emer Bog SAC, Mottisfont Bats SAC, Solent and Southampton Water Ramsar, Solent Maritime SAC and the Salisbury Plain SAC - Water quantity level and flow in-combination on the River Itchen SAC (abstraction) - Recreational pressure in-combination on the Salisbury Plain SAC and SPA <p>The site sits within the River Test catchment. Therefore, no connecting impact pathway to River Itchen or River Avon SAC with regards to nutrient neutrality.</p>
324 [Policy NA9]	Land South East of Ludgershall	1,150 dwellings	<p>This site is screened in due to the potential for likely significant effects on European sites through the following impacts:</p> <ul style="list-style-type: none"> - Nutrient neutrality in-combination on the Solent European sites - Air quality in-combination on the New Forest SAC and Ramsar, Emer Bog SAC, Mottisfont Bats SAC, Solent and Southampton Water Ramsar, Solent Maritime SAC and the Salisbury Plain SAC - Recreational pressure in-combination on the Salisbury Plain SAC and SPA

Site Reference (SHELAA Ref)	Site Address	Proposed Approximate Capacity (Residential/Commercial)	Potential Likely Significant Effects
			<ul style="list-style-type: none"> - Water quantity level and flow in-combination on the River Itchen SAC (abstraction) <p>The site sits within the River Test catchment. Therefore, no connecting impact pathway to River Itchen or River Avon SAC with regards to nutrient neutrality.</p>
154 [Policy SA5]	Land South of the Bypass, South Romsey	110 dwellings	<p>This site is screened in due to the potential for likely significant effects on European sites through the following impacts:</p> <ul style="list-style-type: none"> - Nutrient neutrality in-combination on the Solent European sites - Air quality in-combination on the New Forest SAC and Ramsar, Emer Bog SAC, Mottisfont Bats SAC, Solent and Southampton Water Ramsar, Solent Maritime SAC and the Salisbury Plain SAC - Recreational pressure in-combination on the New Forest SAC, SPA and Ramsar and the Solent European sites - Loss of functionally in-combination linked land on Mottisfont Bats SAC - Water quantity level and flow in-combination on the River Itchen SAC (abstraction) <p>The site sits within the River Test catchment. Therefore, no connecting impact pathway to River Itchen or River Avon SAC with regards to nutrient neutrality.</p>
82, 285 [Policy SA6]	Land at Velmore Farm, Valley Park	1,070 dwellings and 1.5 Hectares commercial	<p>This site is screened in due to the potential for likely significant effects on European sites through the following impacts:</p> <ul style="list-style-type: none"> - Nutrient neutrality in-combination on the Solent European sites (nitrogen) and River Itchen SAC (phosphorous wastewater only) - Air quality in-combination on the New Forest SAC and Ramsar, Emer Bog SAC, Mottisfont Bats SAC, Solent and Southampton Water Ramsar, Solent Maritime SAC and the Salisbury Plain SAC - Recreational pressure in-combination on the New Forest SAC, SPA and Ramsar and the Solent European sites.

Site Reference (SHELAA Ref)	Site Address	Proposed Approximate Capacity (Residential/Commercial)	Potential Likely Significant Effects
			<ul style="list-style-type: none"> - Water quantity level and flow in-combination on the River Itchen SAC (abstraction)
284 [Policy SA4]	Land South of Ganger Farm, Romsey	340 dwellings	<p>This site is screened in due to the potential for likely significant effects on European sites through the following impacts:</p> <ul style="list-style-type: none"> - Nutrient neutrality in-combination on the Solent European sites - Air quality in-combination on the New Forest SAC and Ramsar, Emer Bog SAC, Mottisfont Bats SAC, Solent and Southampton Water Ramsar, Solent Maritime SAC and the Salisbury Plain SAC - Recreational pressure in-combination on the New Forest SAC, SPA and Ramsar. - Loss of functionally linked land in-combination on Mottisfont Bats SAC - Water quantity level and flow in-combination on the River Itchen SAC (abstraction) <p>The site sits within the River Test catchment. Therefore, no connecting impact pathway to River Itchen or River Avon SAC with regards to nutrient neutrality.</p>
295 [Policy SA7]	Land at King Edward Park, Ampfield	44 C2 units (extra care accommodation)	<p>This site is screened in due to the potential for likely significant effects on European sites through the following impacts:</p> <ul style="list-style-type: none"> - Nutrient neutrality in-combination on the Solent European sites (nitrogen) and the River Itchen SAC (phosphorous wastewater only) - Air quality in-combination on the New Forest SAC and Ramsar, Emer Bog SAC, Mottisfont Bats SAC, Solent and Southampton Water Ramsar, Solent Maritime SAC and the Salisbury Plain SAC - Recreational pressure in-combination on the New Forest SAC, SPA and Ramsar - Water quantity level and flow in-combination on the River Itchen SAC (abstraction)
401	Land south of Thruxton Aerodrome	15 Hectares	<p>This site is screened in due to the potential for likely significant effects on European sites through the following impacts:</p>

Site Reference (SHELAA Ref)	Site Address	Proposed Approximate Capacity (Residential/Commercial)	Potential Likely Significant Effects
[Policy NA10]			<ul style="list-style-type: none"> - Air quality in-combination on the New Forest SAC and Ramsar, Emer Bog SAC, Mottisfont Bats SAC, Solent and Southampton Water Ramsar, Solent Maritime SAC and the Salisbury Plain SAC - Water quantity level and flow in-combination on the River Itchen SAC (abstraction)
133 [Policy SA9]	Land adjacent to Abbey Park, Romsey	5.86 Hectares	<p>This site is screened in due to the potential for likely significant effects on European sites through the following impacts:</p> <ul style="list-style-type: none"> - Air quality in-combination on the New Forest SAC and Ramsar, Emer Bog SAC, Mottisfont Bats SAC, Solent and Southampton Water Ramsar, Solent Maritime SAC and the Salisbury Plain SAC - Water quantity level and flow in-combination on the River Itchen SAC (abstraction)
296 [Policy SA10]	South of Botley Road, Romsey	1.2 Hectares	<p>This site is screened in due to the potential for likely significant effects on European Site through the following impacts:</p> <ul style="list-style-type: none"> - Air quality in-combination on the New Forest SAC and Ramsar, Emer Bog SAC, Mottisfont Bats SAC, Solent and Southampton Water Ramsar, Solent Maritime SAC and the Salisbury Plain SAC - Water quantity level and flow in-combination on the River Itchen SAC (abstraction)
244 [Policy SA12]	Kennels Farm, Extension to University of Southampton Science Park	3.9 Hectares	<p>This site is screened in due to the potential for likely significant effects on European sites through the following impacts:</p> <ul style="list-style-type: none"> - Air quality in-combination on the New Forest SAC and Ramsar, Emer Bog SAC, Mottisfont Bats SAC, Solent and Southampton Water Ramsar, Solent Maritime SAC and the Salisbury Plain SAC - Water quantity level and flow in-combination on the River Itchen SAC (abstraction)

Site Reference (SHELAA Ref)	Site Address	Proposed Approximate Capacity (Residential/Commercial)	Potential Likely Significant Effects
385, 394 [Policy SA8]	Land at Upton Lane, Nursling	8.5 Hectares and limited residential	<p>This site is screened in due to the potential for likely significant effects on European sites through the following impacts:</p> <ul style="list-style-type: none"> - Air quality in-combination on the New Forest SAC and Ramsar, Emer Bog SAC, Mottisfont Bats SAC, Solent and Southampton Water Ramsar, Solent Maritime SAC and the Salisbury Plain SAC - Nutrient neutrality in-combination on the Solent European sites - Recreational pressure in-combination on the New Forest SAC, SPA and Ramsar and the Solent European sites - Water quantity level and flow in-combination on the River Itchen SAC (abstraction)
397 [Policy SA11]	Land at Test Valley Business Park, North Baddesley	2.2 Hectares	<p>This site is screened in due to the potential for likely significant effects on European sites through the following impacts:</p> <ul style="list-style-type: none"> - Air quality in-combination on the New Forest SAC and Ramsar, Emer Bog SAC, Mottisfont Bats SAC, Solent and Southampton Water Ramsar, Solent Maritime SAC and the Salisbury Plain SAC - Water quantity level and flow on Emer Bog and River Itchen SAC - Water quality on Emer Bog
418 [Policy HOU8]	Land at Bunny Lane, Romsey	4 Gypsy and traveller pitches	<p>This site is screened in due to the potential for likely significant effects on European sites through the following impacts:</p> <ul style="list-style-type: none"> - Air quality in-combination on the New Forest SAC and Ramsar, Emer Bog SAC, Mottisfont Bats SAC, Solent and Southampton Water Ramsar, Solent Maritime SAC and the Salisbury Plain SAC - Loss of functionally linked land in-combination on Mottisfont Bats SAC - Recreational pressure in-combination on the New Forest SAC, SPA and Ramsar

Site Reference (SHELAA Ref)	Site Address	Proposed Approximate Capacity (Residential/Commercial)	Potential Likely Significant Effects
			<ul style="list-style-type: none"> - Nutrient neutrality in-combination on the Solent European sites - Water quantity level and flow in-combination on the River Itchen SAC (abstraction) <p>The site sits within the River Test catchment. Therefore, no connecting impact pathway to River Itchen or River Avon SAC with regards to nutrient neutrality.</p>

Summary of Allocations Screening

- 4.3 The table above has highlighted that all allocations have been screened in for appropriate assessment as in the absence of mitigation, likely significant effects cannot be screened out. With regards to specific impact pathways that have been considered to have likely significant effect, a summary is provided below:

Recreational Pressure

- 4.4 Recreational pressure is a known impact for several European sites within and adjacent to the borough including through disturbance to birds, trampling and eutrophication from dog waste. The allocations within Table 6 were screened in where they are located within a recreational catchment area. The relevant recreational catchments are listed below:

- New Forest SAC, SPA and Ramsar has a core recreational catchment of 13.8km from the designated sites' boundary, with an additional catchment area up to 15km for screening larger scale developments.
- Solent and Southampton Water SPA and Ramsar, Solent Maritime SAC and Solent and Dorset Coast SPA has a recreational catchment of 5.6 km outside of the sites' boundaries.
- Salisbury Plain SAC and SPA has a recreational catchment of 6.4 km outside of the site boundary.

Functionally Linked Land

- 4.5 Functionally linked land is so called as it provides a function linked to the maintenance of the SAC/SPA population but is not in itself designated. Land can be functionally linked around both avian and bat sites and provide land for foraging, loafing, roosting and commuting between these areas and the designated site. The allocations within Table 6 were screened in where they are allocated within the relevant core catchments. The relevant core catchments are listed below:

- Mottisfont Bats SAC is designated for maternity colonies of barbastelle (*Barbastella barbastellus*). Barbastelle bats, for which local evidence suggests a sustenance zone (the zone in which they regularly forage to sustain the population) of 7.5 km is appropriate.

Water Pollution – Nutrient Neutrality

- 4.6 Eutrophication within the Solent and the Solent European sites is a known issue. The increase in nutrient load from effluent and agriculture causes and increase in algal blooms and where the Solent is protected by the Isle of Wight it has low wave action and cannot break up the algal mats. This can then damage designated habitats and reduce availability of food for designated species. The majority of the borough is within the water catchment of the Solent and therefore all residential allocations within the borough have been screened into the appropriate assessment. Within the river environment phosphorous is the limiting plant nutrient and so eutrophication in the riverine environment is associated with discharges containing phosphorous. Additionally for phosphorus, areas discharging to the Chickenhall Wastewater Treatment Works (WwTW) are also included, which cover Valley Park, and the Hocombe area of Ampfield. The WwTW discharges into the River Itchen SAC. None of the allocations are within the relevant catchment for the River Avon SAC.

Water Quantity, Level and Flow

- 4.7 Increases in residential and employment development can increase the demand for potable water, this is usually abstracted from groundwater, rivers or drained down from reservoirs. Southern Water is responsible for the majority of the borough's water supply. The borough is also in an area of high water stress meaning that at peak time there is potentially not enough supply for the demand. Therefore, any development within the borough could increase the pressures on abstraction from rivers such as the Itchen. This is discussed further in the appropriate assessment, referencing the Water Resource Management Plan and Drought Plan of Southern Water. Ultimately, it is the statutory water providers Water Resource Management Plan (WRMP) and its Habitats Regulations Assessment that are responsible for ensuring that the level of abstraction within these rivers is acceptable and are based on robust population projections in-combination. Test Valley is primarily served by Southern Water who abstract from the River Itchen (in particular) and River Test, but not the River Avon. All residential allocations within the borough have been screened into the appropriate

assessment, which will provide a short discussion on how the WRMP and its HRA ensure appropriate mitigation.

- 4.8 A single commercial allocation has been allocated within the Wider Catchment of Emer Bog SAC, this has the potential to disrupt the quantity level and flow of water reaching the SAC and therefore has been screened into the appropriate assessment.

Air Quality

- 4.9 Increases in residential and employment development can increase cars on the roads and therefore increase nitrogen deposited on sensitive designated habitats. Nitrogen deposition occurs within 200m of the road and therefore designated sites within 200m of a main road with sensitive habitats could be affected, these include Solent Maritime SAC, Solent and Southampton Water Ramsar site, Salisbury Plain SAC, New Forest SAC and Ramsar, Emer Bog and Mottisfont Bats SAC. All allocations within the Local Plan 2040 have been screened in as this effect builds in-combination with development within the whole borough and neighbouring areas in proximity to the European sites.

Policies in the Local Plan 2040

- 4.10 Table 7 overleaf set out each proposed policy in the Test Valley Local Plan. For each site, a judgment is made in the last column of the table as to whether it could present any conceivable impact pathway to European sites. The orange colour indicates conceivable impact pathways to European sites, the green colour indicates no likely significant impact pathways to European sites. The proposed allocations referred to above are also included for completeness.

Table 7. Policies in Test Valley Local Plan

Policy	Summary	Potential Likely Significant Effects?
SS1: Settlement Hierarchy	Identifies the settlement hierarchy for the borough and a presumption in favour of sustainable development within settlement boundaries.	No likely significant effect – where a settlement sits in the hierarchy will not result in effects on European sites and the policy does not allocate a quantum of development merely sets out criteria for development management.
SS2: Development in the Countryside	Sets out relevant policies that apply for development in the countryside outside of the settlement hierarchy boundaries.	No likely significant effect – the policy does not allocate a quantum of development merely sets out criteria for development management.
SS3: Housing Requirement	Expands on the spatial strategy by setting out the quantum of housing to be delivered across the borough to 2040, which is a minimum of 11,000 dwellings.	Likely significant effects cannot be dismissed since this policy determines the ultimate quantum of housing development. The location of the development will determine the impact pathways relevant to this policy.
SS4: Rural Housing Requirement	Expands on the spatial strategy by setting out the quantum of housing to be delivered in rural areas to 2040, which is a minimum of 542 dwellings.	Likely significant effects cannot be dismissed since this policy determines the ultimate quantum of housing development. The location of the development will determine the impact pathways relevant to this policy.
SS5: Neighbourhood Development Plan Housing Requirements	Expands on the spatial strategy by setting out the quantum of housing to be delivered in Neighbourhood Plans Areas to 2040.	Likely significant effects cannot be dismissed since this policy determines the ultimate quantum of housing development. The location of the development will determine the impact pathways relevant to this policy.
SS6: Meeting the Housing Requirement	Expands on the spatial strategy by setting out the quantum of housing to be delivered and the locations.	Likely significant effects cannot be dismissed since this policy determines the ultimate quantum of housing development. The location of the allocations will determine the impact pathways relevant to this policy. These are highlighted by allocation in Table 6.
SS7: Employment Land Requirement	Sets out the quantum of employment land to be delivered across the borough to 2040, which is a minimum of 71.7 hectares.	Likely significant effects cannot be dismissed since this policy determines the ultimate quantum of employment development
SS8: Meeting Employment Land Requirement	Expands on SS7 by setting out sites and allocations that will be supported in development for employment uses.	Likely significant effects cannot be dismissed since this policy determines the ultimate quantum of employment development

Policy	Summary	Potential Likely Significant Effects?
SS9: Delivery, Monitoring and Contingency	Sets out the need to monitor and investigate the delivery of the Local Plan and developments so if necessary contingency measures or other appropriate actions can be implemented	No likely significant effect – this policy seeks to shape development but does not affect or specify quantum or location and thus will not pose impact pathways to European sites
NA1: Andover Town Centre	Sets out how development and redevelopment should be achieved in Andover Town Centre. Policy NA1 identifies the quantum of housing to be delivered in Andover Town Centre, accommodating approximately 420 homes.	Likely significant effects cannot be dismissed since this policy determines the ultimate quantum of housing development in this location.
NA2: Delivering High Quality Development in Andover Town Centre	Outlines how development in Andover Town Centre will be done to a high quality and will take into consideration how it impacts the existing character and setting of the town centre.	No likely significant effect – this policy seeks to shape development but does not affect or specify quantum or location and thus will not pose impact pathways to European sites
NA3: Andover Town Centre Uses	Expands on NA1 and NA2 outlining that development in Andover town centre should promote mixed use of land and buildings while also being provided in accordance with Town Centre zones outlined within the policy	No likely significant effect – this policy seeks to shape development but does not affect or specify quantum or location and thus will not pose impact pathways to European sites
NA4: Stockbridge Local Centre	Sets out the conditions needing to be met for development fronting in the High Street in Stockbridge	No likely significant effect – this policy seeks to shape development but does not affect or specify quantum or location and thus will not pose impact pathways to European sites
NA5: Land South of London Road, Picket Twenty	Sets out the conditions needing to be met for the housing allocation of approximately 90 dwellings proposed south of London Road at Picket Twenty	Likely significant effects cannot be dismissed since this policy determines the ultimate quantum of housing development. The location of the allocation will determine the impact pathways relevant to this policy. These are highlighted by allocation in Table 6.
NA6: Land at Manor Farm, North Andover	Sets out the conditions needing to be met for the mixed-use allocation of approximately 800 dwellings and 1.5ha of employment allocation space proposed north of Saxon Way at Manor Farm in Andover	Likely significant effects cannot be dismissed since this policy determines the ultimate quantum of housing and employment development. The location of the allocation will determine the impact pathways relevant to this policy. These are highlighted by allocation in Table 6.
NA7: Land at Bere Hill, South Andover	Sets out the conditions needing to be met for the housing allocation of approximately 1400 dwellings proposed south of Andover at Bere Hill	Likely significant effects cannot be dismissed since this policy determines the ultimate quantum of housing development.

Policy	Summary	Potential Likely Significant Effects?
		The location of the allocation will determine the impact pathways relevant to this policy. These are highlighted by allocation in Table 6.
NA8: Land to the East of Ludgershall	Sets out the conditions needing to be met for the housing allocation of approximately 350 dwellings proposed to the East of Ludgershall on the north side of the A342	Likely significant effects cannot be dismissed since this policy determines the ultimate quantum of housing development. The location of the allocation will determine the impact pathways relevant to this policy. These are highlighted by allocation in Table 6.
NA9: Land to the South east of Ludgershall	Sets out the conditions needing to be met for the housing allocation of approximately 1150 dwellings proposed at land east of Ludgershall	Likely significant effects cannot be dismissed since this policy determines the ultimate quantum of housing development. The location of the allocation will determine the impact pathways relevant to this policy. These are highlighted by allocation in Table 6.
NA10: Land south of Thrupton Aerodrome	Sets out the conditions needing to be met for employment allocation of approximately 15 hectares proposed South of Thrupton Aerodrome	Likely significant effects cannot be dismissed since this policy determines the ultimate quantum of employment development. The location of the allocation will determine the impact pathways relevant to this policy. These are highlighted by allocation in Table 6.
NA11: Thrupton Aerodrome, Thrupton	Sets out the conditions needing to be met for employment space to be permitted within the Thrupton Aerodrome site	No likely significant effect – this policy seeks to shape development but does not specify quantum and thus will not pose impact pathways to European sites
SA1: Romsey Town Centre	Sets out that development of South Romsey Town Centre will need to take into account South of Romsey Town Centre Masterplan. The masterplan area will accommodate approximately 30 homes.	Likely significant effects cannot be dismissed since this policy determines the ultimate quantum of housing development in this location.
SA2: Delivering High Quality Development in Romsey Town Centre	Outlines how development in Romsey Town Centre will be done to a high quality and will take into consideration how it impacts the existing character and setting of the town centre	No likely significant effect – this policy seeks to shape development but does not affect or specify quantum or location and thus will not pose impact pathways to European sites
SA3: Romsey Town Centre Uses	Expands on SA1 and SA2 outlining that development in Romsey town centre should promote mixed use of land and buildings while also being provided in accordance with Town Centre zones outlined within the policy	No likely significant effect – this policy seeks to shape development but does not affect or specify quantum or location and thus will not pose impact pathways to European sites

Policy	Summary	Potential Likely Significant Effects?
SA4 Housing Allocation: Land South of Ganger Farm, Romsey	Sets out the conditions needing to be met for a housing allocation of approximately 340 dwellings proposed to the south of Ganger Farm, Romsey	Likely significant effects cannot be dismissed since this policy determines the ultimate quantum of housing development. The location of the allocation will determine the impact pathways relevant to this policy. These are highlighted by allocation in Table 6.
SA5: Housing Allocation: Land South of Bypass, Romsey	Sets out the conditions needing to be met for a housing allocation of approximately 110 dwellings proposed to the south of Bypass Road, Romsey	Likely significant effects cannot be dismissed since this policy determines the ultimate quantum of housing development. The location of the allocation will determine the impact pathways relevant to this policy. These are highlighted by allocation in Table 6.
SA6: Land at Velmore Farm	Sets out the conditions needing to be met for a mixed use allocation of approximately 1070 dwellings and 1.5 hectares of employment land proposed at Land at Velmore Farm, Valley Park	Likely significant effects cannot be dismissed since this policy determines the ultimate quantum of housing and employment development. The location of the allocation will determine the impact pathways relevant to this policy. These are highlighted by allocation in Table 6.
SA7: Land at King Edwards Park, Ampfield	Sets out the conditions needing to be met for a 44 unit extra care accommodation proposed on the eastern edge of Ampfield	Likely significant effects cannot be dismissed since this policy determines the ultimate quantum of housing development. The location of the allocation will determine the impact pathways relevant to this policy. These are highlighted by allocation in Table 6.
SA8: Land at Upton Lane	Sets out the conditions needing to be met for an employment allocation of approximately 8.5 hectares and limited residential development proposed at Upton Triangle	Likely significant effects cannot be dismissed since this policy determines the ultimate quantum of employment and residential development. The location of the allocation will determine the impact pathways relevant to this policy. These are highlighted by allocation in Table 6.

Policy	Summary	Potential Likely Significant Effects?
SA9: Land Adjacent to Abbey Park Industrial Estate, Romsey	Sets out the conditions needing to be met for an employment allocation of approximately 5.86 hectares proposed at Land Adjacent to Abbey Park Industrial Estate, Romsey	Likely significant effects cannot be dismissed since this policy determines the ultimate quantum of employment development. The location of the allocation will determine the impact pathways relevant to this policy. These are highlighted by allocation in Table 6.
SA10: Land South of Botley Road, Romsey	Sets out the conditions needing to be met for an employment allocation of approximately 1.2 hectares proposed at Land South Side of Botley Road, Romsey	Likely significant effects cannot be dismissed since this policy determines the ultimate quantum of employment development. The location of the allocation will determine the impact pathways relevant to this policy. These are highlighted by allocation in Table 6.
SA11: Land East of Test Valley Business Park	Sets out the conditions needing to be met for an employment allocation of approximately 2.2 hectares proposed at Test Valley Business Park, North Baddesley	Likely significant effects cannot be dismissed since this policy determines the ultimate quantum of employment development. The location of the allocation will determine the impact pathways relevant to this policy. These are highlighted by allocation in Table 6.
SA12: Kennels Farm, University of Southampton Science Park, Chilworth	Sets out the conditions needing to be met for an employment allocation of approximately 3.9 hectares is proposed at Kennels Farm, University of Southampton, Chilworth	Likely significant effects cannot be dismissed since this policy determines the ultimate quantum of employment development. The location of the allocation will determine the impact pathways relevant to this policy. These are highlighted by allocation in Table 6.
SA13: University of Southampton Science Park, Chilworth	Sets out the conditions needing to be met for an employment development and support facilities within the University of Southampton Science Park.	No likely significant effect – this policy seeks to shape development but does not affect or specify quantum or location and thus will not pose impact pathways to European sites
SA14: Land at Adanac Park, Nursling	Sets out the conditions needing to be met for the development of office/research/manufacturing Class E(g) and support facilities at Adanac Park, Nursling.	No likely significant effect – this policy seeks to shape development but does not affect or specify quantum or location and thus will not pose impact pathways to European sites
SA15: Nursling Estate, Nursling	Sets out the conditions needing to be met for development within Nursling Estate. The use of land and buildings will be restricted to storage and distribution uses (class B8) and ancillary processing and assembly within class E(g).	No likely significant effect – this policy seeks to shape development but does not affect or specify quantum or location and thus will not pose impact pathways to European sites

Policy	Summary	Potential Likely Significant Effects?
SA16: Forest Park	Proposal for land adjoining the M27 motorway to become a Forest Park.	No likely significant effect – this policy is likely to have neutral or positive effects on European sites, since its purpose is ultimately protective to the environment
CL1: Countering Climate Change	Sets out criteria as to how development proposals will support the delivery of a net zero carbon future and address the impacts of the changing climate through both mitigation and adaptation.	No likely significant effect – this policy is likely to have neutral or positive effects on European sites, since its purpose is ultimately protective to the environment
CL2: Flood Risk	Sets out criteria which development proposals must adhere to, with regards to flood risk.	No likely significant effect – this policy seeks to shape development but does not affect or specify quantum or location and thus will not pose impact pathways to European sites.
CL3: Sustainable Buildings and Energy Use	Sets out criteria as to how proposals should embed the energy hierarchy within the design of buildings by prioritising fabric first, orientation and landscaping in order to minimise energy demand for heating, lighting and cooling.	No likely significant effect – this policy seeks to shape development but does not affect or specify quantum or location and thus will not pose impact pathways to European sites
CL4: Water Use and Management	Sets out criteria which development proposals must adhere to, with regards to water use and management.	No likely significant effect – this policy is likely to have neutral or positive effects on European sites, since its purpose is ultimately protective to the environment
CL5: Renewable and Low Carbon Energy	Sets out criteria for consideration within renewable and low carbon energy and storage and the associated infrastructure proposals	No likely significant effect – while individual renewable energy proposals could have effects on European sites (e.g. wind turbines having barotrauma effects on bats) this policy does not specify a type, scale or location of renewable energy, leaving that to the market.
COM1: Delivering Infrastructure	Sets out criteria development will be required to adhere to, to mitigate the impact of development on infrastructure.	No likely significant effect – while this policy sets out circumstances under which applications may be permitted, it does not specify a quantum or location of development.
COM2: Community Services and Facilities	Sets out criteria a proposal must adhere to where it proposes loss of local shops or public houses.	No likely significant effect – this policy seeks to shape development but does not affect or specify quantum or location and thus will not pose impact pathways to European sites
TC1: Main Town Centre Uses (Sequential Test and Impact Assessment)	Sets out that any main town centre uses that would harm the vitality and viability of the town centres would not be permitted.	No likely significant effect – this policy seeks to shape development but does not affect or specify quantum or location and thus will not pose impact pathways to European sites
ENV1: Historic Environment	Sets out criteria which development must adhere to, to ensure the protection and preservation of significance or special interest of designated or non-designated heritage assets.	No likely significant effect – this policy seeks to shape development but does not affect or specify quantum or location and thus will not pose impact pathways to European sites

Policy	Summary	Potential Likely Significant Effects?
ENV2: Development affecting Heritage Assets	Sets out criteria which development must adhere to ensure the conservation or enhancement of designated or non-designated heritage assets.	No likely significant effect – this policy seeks to shape development but does not affect or specify quantum or location and thus will not pose impact pathways to European sites
ENV3: Landscape Character	Sets out criteria which development must adhere to, to ensure the protection and enhancement of the landscape character of the borough.	No likely significant effect – this policy is likely to have neutral or positive effects on European sites, since its purpose is ultimately protective to the environment
ENV4: Local Gaps	Sets out criteria where development could be permitted within the gaps between local settlements.	No likely significant effect – this policy is likely to have neutral or positive effects on European sites, since its purpose is ultimately protective to the environment
ENV5: Pollution	Aims to protect human health, living conditions, the natural environment and general amenity from pollution facilitated by development.	No likely significant effect – this policy is likely to have neutral or positive effects on European sites, since its purpose is ultimately protective to the environment
ENV6: Lighting	Sets out that development should minimise impacts from artificial light sources upon the skies and landscape, through good design, siting and future management. Also sets out development will be permitted where it maintains or enhances the darkness of the landscape including in the North Wessex AONB.	No likely significant effect – this policy is likely to have neutral or positive effects on European sites, since its purpose is ultimately protective to the environment
ENV7: Amenity	Sets out criteria to protect the amenity of occupants and neighbours of developments.	No likely significant effect – this policy seeks to shape development but does not affect or specify quantum or location and thus will not pose impact pathways to European sites
BIO1: Conservation and Enhancement of Biodiversity and Geological Interest	Sets out that all development shall ensure the conservation, enhancement and restoration of biodiversity and geology, avoiding any adverse impacts on condition, and where relevant recovery, of all types of nature conservation sites, habitats, species and components of ecological networks or geological interests.	No likely significant effect – this policy is likely to have neutral or positive effects on European sites, since its purpose is ultimately protective to the environment
BIO2: International Nature Conservation Designations	Sets out that all development that is likely to have a significant effect, either alone or in-combination, on an international nature conservation designation will be required to clearly demonstrate that any potential adverse effects on the integrity of such designations are fully mitigated.	No likely significant effect – this policy is likely to have a positive effect on European sites, since its purpose is ultimately protective to the environment
BIO3: Biodiversity Net Gain	Sets out that all development for one or more dwellings or non-residential buildings will be permitted provided that it is designed to	No likely significant effect – this policy is likely to have neutral or positive effects on European sites, since its purpose is ultimately protective to the environment

Policy	Summary	Potential Likely Significant Effects?
	deliver at least a 10% net gain and this should be secured and maintained for a minimum of 30 years.	
BIO4: Green Infrastructure	Sets out that all development will conserve and enhance green and blue infrastructure through criteria within the policy.	No likely significant effect – this policy is likely to have neutral or positive effects on European sites, since its purpose is ultimately protective to the environment
BIO5: Trees and Hedgerows	Sets out the avoidance of loss of trees, hedgerows and irreplaceable habitats, and provides for the planting of new trees, woodland and hedgerow as well as maintenance of these in short and long term.	No likely significant effect – this policy is likely to have neutral or positive effects on European sites, since its purpose is ultimately protective to the environment
HE1: Open space and Recreation	Sets out the minimum requirement of open space and recreation provision for major residential development.	No likely significant effect – this policy is likely to have neutral or positive effects on European sites, since its purpose is ultimately protective to the environment
HE2: Existing Open Space	Sets out the criteria for development to be permitted on existing open space, sports and recreational buildings and land.	No likely significant effect – this policy is likely to have neutral or positive effects on European sites, since its purpose is ultimately protective to the environment
HE3: Access to the Countryside	Support the increased public access to the countryside where it is designed to safeguard, enhance and integrate rights of way that do not adversely affect the countryside’s recreational and amenity value.	No likely significant effect – this policy seeks to shape development but does not affect or specify quantum or location and thus will not pose impact pathways to European sites
DES1: Delivery of Sustainable and High-Quality Design	Sets out the requirement for all developments to achieve high quality design which will conserve and enrich the character and identity of the borough’s towns, villages and landscape.	No likely significant effect – this policy seeks to shape development but does not affect or specify quantum or location and thus will not pose impact pathways to European sites
DES2: Design Details and Considerations	Sets out the design details that must be taken into consideration for all developments.	No likely significant effect – this policy seeks to shape development but does not affect or specify quantum or location and thus will not pose impact pathways to European sites
DES3: Residential Areas of Special Character	Sets out where development will be supported and criteria for residential areas of special character.	No likely significant effect – this policy seeks to shape development but does not affect or specify quantum or location and thus will not pose impact pathways to European sites
DES4: Public Art	Sets out where public art that makes a contribution towards the character, appearance and local distinctiveness of the area will be required in proposals.	No likely significant effect – this policy does not pose impact pathways to European sites

Policy	Summary	Potential Likely Significant Effects?
HOU1: Affordable Housing	Sets out that the Council will seek affordable housing provision through development proposals to meet the needs of communities.	No likely significant effect – this policy seeks to shape development but does not affect or specify quantum or location and thus will not pose impact pathways to European sites
HOU2: Community Led Development	Sets out criteria which community led development proposals must adhere to.	No likely significant effect – while this policy sets out circumstances under which applications may be permitted, it does not specify a quantum or location of development.
HOU3: Rural Exception Affordable Housing	Sets out criteria which development proposals for rural affordable housing must adhere to.	No likely significant effect – while this policy sets out circumstances under which applications may be permitted, it does not specify a quantum or location of development.
HOU4: First Homes Exception Affordable Housing	Sets out criteria First Home exception affordable housing must adhere to.	No likely significant effect – this policy seeks to shape development but does not affect or specify quantum or location and thus will not pose impact pathways to European sites
HOU5: Provision of Housing to Meet our Needs	Sets out that areas are likely to need a range of housing provision and the criteria for this.	No likely significant effect – this policy seeks to shape development but does not affect or specify quantum or location and thus will not pose impact pathways to European sites
HOU6: Residential Space Standards	Sets out that development proposals should be delivered to ensure that standards for accessibility and adaptability are achieved.	No likely significant effect – this policy seeks to shape development but does not affect or specify quantum or location and thus will not pose impact pathways to European sites
HOU7: Self-Build and Custom Build Housing	Sets out where development proposals should incorporate self-builds and/or custom build homes.	No likely significant effect – while this policy sets out circumstances under which applications may be permitted, it does not specify a quantum or location of development.
HOU8: Meeting the needs of Gypsies, Traveller and Travelling Showpeople	Sets out the requirement for the borough to provide 44 pitches for gypsies and travellers and 25 plots for travelling showpeople.	Likely significant effects cannot be dismissed since this policy determines the ultimate quantum of accommodation.
HOU9: Gypsies, Travellers and Traveling Showpeople	Sets out the criteria which development proposals to accommodate gypsies, travellers and travelling showpeople must adhere to.	No likely significant effect – while this policy sets out circumstances under which applications may be permitted, it does not specify a quantum or location of development.
HOU10: Occupational Accommodation for Rural Workers in the Countryside	Sets out criteria that development proposals for occupational accommodation of rural workers must adhere to.	No likely significant effect – while this policy sets out circumstances under which applications may be permitted, it does not specify a quantum or location of development.
HOU11: Existing Dwellings and Ancillary Residential Development in the Countryside	Sets out criteria that development proposals for the extension of existing dwellings or the creation and extension of ancillary domestic buildings in the existing curtilage must adhere to.	No likely significant effect – while this policy sets out circumstances under which applications may be permitted, it does not specify a quantum or location of development.

Policy	Summary	Potential Likely Significant Effects?
HOU12: Replacement Dwellings in the Countryside	Sets out the criteria that development proposals for replacement of an existing dwelling within the countryside must adhere to.	No likely significant effect – while this policy sets out circumstances under which applications may be permitted, it does not specify a quantum or location of development.
EC1: Retention of Employment Land and Strategic Employment Sites	Sets out criteria that development on employment land and strategic employment sites must adhere to.	No likely significant effect – while this policy sets out circumstances under which applications may be permitted, it does not specify a quantum or location of development.
EC2: Re-Use of Buildings in the Countryside	Sets out the criteria for which development proposals must adhere where the reuse of buildings in the countryside is proposed.	No likely significant effect – while this policy sets out circumstances under which applications may be permitted, it does not specify a quantum or location of development.
EC3: Rural Diversification and Employment Sites in the Countryside	Sets out criteria by which proposals for diversification of existing businesses, including the redevelopment, extension of buildings or erection of new buildings on existing employment sites in the countryside for employment use would need to adhere to.	No likely significant effect – while this policy sets out circumstances under which applications may be permitted, it does not specify a quantum or location of development.
EC4: Tourism	Provides criteria which proposals must adhere where development of tourism facilities and accommodation is proposed or the loss of existing tourist accommodation.	No likely significant effect – while this policy is supportive of tourism, and increased tourism could have negative impacts on European sites, the supporting text makes it clear that this policy is supportive of sustainable tourism. By definition sustainable tourism would not have significant adverse effects on European sites.
EC5: Skills and Training	Sets out that where a development has a significant impact on the labour market, contributions towards the enhancement of skills and training and the provision of apprenticeships within the local community will be necessary.	No likely significant effect – this policy will not pose any impact pathways to European sites
TR1: Active and Sustainable Travel	Provides criteria in relation to active and sustainable travel that development will need to adhere to.	No likely significant effect – this policy is likely to have neutral or positive effects on European sites, since its purpose is ultimately protective to the environment
TR2: Assessing Transport Impacts	Ensures transport assessments/statements are undertaken where necessary and delivery of travel infrastructure within development and wider network is timely.	No likely significant effect – this policy sets out assessment requirements and thus will not pose impact pathways to European sites
TR3: Parking	Ensures compliance with parking standards and sets criteria where parking below the standards would be considered.	No likely significant effect – this policy seeks to shape development but does not affect or specify quantum or location and thus will not pose impact pathways to European sites

4.11 This assessment finds the following policies may have conceivable impact pathways to European sites:

- SA4 Housing Allocation: Land South of Ganger Farm, Romsey
- SA5: Housing Allocation: Land South of Bypass, Romsey
- SA6: Land at Velmore Farm
- SA7: Land at King Edwards Park, Ampfield
- SA8: Land at Upton Lane
- SA1: Romsey Town Centre
- NA8: Land to the East of Ludgershall
- NA9: Land to the South east of Ludgershall
- NA10: Land south of Thruxton Aerodrome
- NA1: Andover Town Centre
- NA5: Land South of London Road, Picket Twenty
- NA6: Land at Manor Farm, North Andover
- NA7: Land at Bere Hill, South Andover
- SS3: Housing Requirement
- SS4: Rural Housing Requirement
- SS5: Neighbourhood Development Plan Housing Requirements
- SS6: Meeting the Housing Requirement
- SS7: Employment Land Requirement
- SS8: Meeting Employment Land Requirement
- HOU8: Meeting the needs of Gypsies, Traveller and Travelling Showpeople
- SA12: Kennels Farm, University of Southampton Science Park, Chilworth
- SA11: Land East of Test Valley Business Park
- SA9: Land Adjacent to Abbey Park Industrial Estate, Romsey

- SA10: Land South of Botley Road, Romsey

5. Appropriate Assessment

Water Quality

Nutrient Neutrality

- 5.1 The Solent European sites are vulnerable to nutrient nitrogen input from both treated wastewater and surface runoff. There are a number of mechanisms already in place to reduce the scale of nutrient input within the river and lake catchments and coastal waterbodies. Within the Solent catchment both the Department for Environment, Food and Rural Affairs (Defra) and partnership funded Catchment Sensitive Farming (CSF) programmes work with agriculture to reduce diffuse agricultural sources of pollution such as fertiliser and slurry run-off. One of the aims of this work is to deliver environmental benefits from reducing diffuse water pollution. To achieve these goals the CSF partnership delivers practical solutions and targeted support which should enable farmers and land managers to take voluntary action to reduce diffuse water pollution from agriculture to protect water bodies and the environment.
- 5.2 Natural England's Site Improvement Plan (SIP) for the Solent states that water pollution affects a range of habitats and bird species through eutrophication (in the case of birds through cascading effects mediated through the food chain) and direct toxicity. Sources include both point-source discharges (e.g. from flood alleviation / storm discharges and Wastewater Treatment Works (WwTWs)) and diffuse nitrogen leaching, such as from agricultural and road surface run-off. Currently, it is now advised that nitrogen and phosphorus concentrations entering the Solent are continuously monitored to identify the scale of nutrient inputs to the marine environment.
- 5.3 In contrast to the Solent European sites' vulnerability to nitrogen, the River Itchen SAC is vulnerable to nutrient phosphorous input as phosphorus rather than nitrogen is typically the principal growth-limiting nutrient (controlling eutrophication) in lowland river systems. Therefore, in addition to the need for nitrogen nutrient neutrality regarding surface runoff, site allocations that ultimately discharge into the River Itchen (Land at King Edwards Park, Ampfield and Land at Velmore Farm, Valley Park) require nutrient neutrality for phosphorus in the wastewater element only.
- 5.4 Any new residential or employment development within either the Solent or Itchen catchments in Test Valley borough as a result of the Local Plan has potential to result in increased levels of nutrients entering the Solent and/or River Itchen SAC catchment zones. In the preceding section, the following site allocations were screened in with relation to nutrient neutrality:
- Land South of London Road, East Andover
 - Land at Bere Hill, South East Andover
 - Land at Manor Farm, North of Saxon Way, North Andover
 - Land east of Ludgershall
 - Land South East of Ludgershall
 - Land South of the Bypass, South Romsey
 - Ganger Farm, Romsey
 - Land at Velmore Farm, Valley Park
 - Land at King Edwards Park, Ampfield
 - Upton Lane, Nursling
 - Land at Bunny Lane, Romsey
- 5.5 The estimated nitrogen budgets for each relevant site allocation are detailed below in Table 8 using the March 2022 guidance. The annual nutrient budget for the site allocations as a whole is 14,972.63 kg/N. However, the Levelling Up and Regeneration Act 2023 proposes changes that may have implications for the calculation of nutrient budgets therefore these numbers may be subject to change.

Table 8. Summary of Nutrient Nitrogen Budget for Test Valley Local Plan Site Allocations. Note Upton Lane Nursling is not included as there is no specified quantum of residential development at this stage.

Site Allocation	Number of New Dwellings	Net nitrogen (kg/yr)
Land at Bere Hill, South East Andover	1400	4218.46
Land South of Ganger Farm, East Romsey	340	1128.25
Land at Manor Farm, North of Saxon Way, North Andover	800	1306.22
Land east of Ludgershall	350	1094.31
Land at King Edwards Park, Ampfield	44	156.93
Land South East of Ludgershall	1150	3054.58
Land South of the Bypass, South Romsey	110	401.95
Land South of London Road, East Andover	90	249.22
Land at Velmore Farm, Valley Park	1070	3349.08
Land at Bunny Lane, Romsey	4 traveller pitches	13.63

5.6 The phosphorus budgets for each relevant site allocation based on the March 2022 guidance are detailed below in Table 9. It totals 139.98 kg/P.

Table 9. Summary of Nutrient Phosphorus Budget for Test Valley Local Plan Site Allocations

Site Allocation	Number of New Dwellings	Net phosphorus (kg/yr)
Land at King Edwards Park, Ampfield	44	5.03
Land at Velmore Farm, Valley Park	1070	134.95

Mitigation Contained in the Local Plan

- 5.7 While mitigation to offset the identified 14,972.63 kg/N/yr and 139.98 kg/P/yr does not need to be secured at the Local Plan stage, there needs to be adequate confidence that sufficient mitigation is likely to be available. As an example, to offset 230.81 kgN/yr approximately 11 additional hectares of arable land would need to be removed from production and rewilded. Alternative solutions involving less land might involve creation of a wetland or wetlands to treat surface runoff to a sufficient standard to offset the nutrients entering the catchment from the development.
- 5.8 The emerging Test Valley Local Plan refers to water quality in the Solent and River Itchen SAC and River Avon SAC designations and the concept of nutrient neutrality in Policy BIO2: International Nature Conservation Designations. It states that '*Development that is likely to have a significant effect, either alone or in-combination, on an international nature conservation designation will be required to clearly demonstrate that any potential adverse effects on the integrity of such designations are fully mitigated. This includes... nutrient neutrality within the relevant catchment areas for the River Avon SAC, River Itchen SAC and the Solent Designations....*' This policy text aligns the plan document with Natural England's requirement and places the onus on developers to ensure that there will be no net nutrient input to the Solent from future development. Although there are no allocations within the catchment of the River Avon SAC there is the potential for windfall development in this area, and any such windfall would be covered by Policy BIO2.
- 5.9 The supporting text for Policy BIO2 highlights the requirements for developments to calculate their scheme's nutrient budgets to ensure that the risk of excess nutrient output, in combination with other schemes, is avoided. The text refers to additional guidance and resources that are available via the Council's website but are not included in the Local Plan document.

Recommendation

- 5.10 On the Council's website⁷³ there is additional guidance for the calculation of nutrient budget, as well as a Nutrient Neutrality Off-Site Mitigation Framework⁷⁴ which details how and when off-site mitigation should be used to achieve nutrient neutrality. This contributes to confidence that sufficient mitigation is likely to be available, if not on-site, then off-site.
- 5.11 The general requirements list in Appendix 5 of the Local Plan includes the reference to nutrient neutrality as this affects all sites, thus providing clarity as to all sites affected.
- 5.12 **Until the Test Valley Local Plan sets out the intended mitigation solutions for at least the first 5 year plan period (since Local Plans must in any event be reviewed every 5 years) for the allocated sites, adverse effects of the plan on the integrity of the Solent European sites and River Itchen SAC cannot be excluded, in combination with other plans and projects.**

Emer Bog SAC

- 5.13 Emer Bog SAC is designated for Annex I habitat of transition mires and quaking bogs for which this is considered to be one of the best areas in the United Kingdom. These areas of transition mires and quaking bog are mostly threatened by hydrological, eutrophication as well as erosion and fragmentation on to the unstable 'quaking' surface. Emer Bog consists of eastern and western areas of open swamp and mire communities with large wet areas of tall herb fen with small open pools resulting in much of the site being inaccessible to the public⁷⁵.
- 5.14 The Land at Test Valley Business Park, North Baddesley has the potential to negatively impact the hydrology at Emer Bog SAC without appropriate mitigation since it lies within its surface water catchment.

Mitigation Contained in the Local Plan

- 5.15 The emerging Test Valley Local Plan refers to Emer Bog's sensitivity to hydrological changes in Policy BIO2: International Nature Conservation Designations. It states that '*Development that is likely to have a significant effect, either alone or in-combination, on an international nature conservation designation will be required to clearly demonstrate that any potential adverse effects on the integrity of such designations are fully mitigated. This includes... hydrology of Emer Bog SAC...*'.
- 5.16 Test Valley Southern Area Policy 11 (SA11): Land East of Test Valley Business Park identified the Test Valley Business Park as being within the wider hydrology catchment zone for Emer Bog SAC. The supporting text states that utilising the existing public drainage network is likely to be enough to prevent changes to ground water; however, it also recommends ecological and hydrological assessment to ensure there are no significant impacts.

Recommendation

- 5.17 On the Council's website⁷⁶ there is additional guidance for requirements of future developments within the catchment of Emer Bog⁷⁷. Developments, including site allocations, will need detailed assessments to demonstrate that any changes to surface and/or groundwater would not affect the Emer Bog's hydrology.
- 5.18 **Policy BIO2 or the additional guidance should be updated to include recommendations for mitigation to prevent hydrological changes such as the provision of Sustainable Drainage Systems (SuDS).**

⁷³ <https://testvalley.gov.uk/planning-and-building/guidance/solent-southampton-water-special-protection-area> [accessed 20/12/2023]

⁷⁴ Test Valley Borough Council (2021) Solent Region SPAs, SACs and Ramsar sites – Nutrient Neutrality Test Valley Off-Site Mitigation Framework.

⁷⁵ Allen, R. (2003). *Surface water quality and hydro-ecological regime of Emer Bog SAC*. Environment Agency.

⁷⁶ <https://testvalley.gov.uk/planning-and-building/guidance/solent-southampton-water-special-protection-area> [accessed 20/12/2023]

⁷⁷ Test Valley Borough Council (2017) Emer Bog and Baddesley Common Hydrology Study Guidance Note

Air Quality

5.19 Air quality modelling was undertaken for the Local Plan – the methodology is set out separately in the Air Quality Modelling report. The following sites deliver housing and employment growth within Test Valley Borough and therefore contribute cumulatively to increased vehicle movements on the road network:

- Land South of London Road, East Andover
- Land at Bere Hill, South East Andover
- Land at Manor Farm, North of Saxon Way, North Andover
- Land east of Ludgershall
- Land South East of Ludgershall
- Land South of the Bypass, South Romsey
- Land at Velmore Farm, Valley Park
- Land South of Ganger Farm, East Romsey
- Land at King Edwards Park, Ampfield
- Land south of Thruxton Aerodrome
- Land adjacent to Abbey Park, Romsey
- South of Botley Road, Romsey
- Kennels Farm, Extension to University of Southampton Science Park
- Land at Upton Lane, Nursling
- Land at Test Valley Business Park, North Baddesley
- Land at Bunny Lane, Romsey

5.20 Two development scenarios were modelled. Because the traffic modelling took place earlier in the Local Plan period neither scenario precisely reflects the actual distribution and amount of development in the Local Plan as published. The closest alignment between growth scenarios and likely allocations is different between the north and south of the borough. However, the difference is very small, with the only differences being small changes (e.g. of 0.01) in the second decimal place.

5.21 A total of sixteen transects were modelled covering all roads within 200m of European sites (including Solent Maritime SAC, Solent and Southampton Water Ramsar site, Salisbury Plain SAC, New Forest SAC and Ramsar, Emer Bog and Mottisfont Bats SAC) where a greater than nominal change in traffic is expected to occur as a result of the Local Plan. The results of the modelling are presented in Appendix C. The methodology and maps showing the transects provided separately in the Air Quality Modelling report. For NO_x, total concentrations are forecast to fall below the critical level across every transect by 2041⁷⁸, with or without the Local Plan. Since the critical level (the concentration of pollutants in atmosphere above which adverse effects may occur according to current science) will not be exceeded, no adverse effects will arise from NO_x in atmosphere.

5.22 With regard to ammonia, the upper critical level (3 µg_m⁻³) will not be exceeded on any transect under any scenario by 2041. Since the upper critical level applies to most vegetation this means that an adverse effect is not forecast to arise from ammonia in atmosphere. Two sites covered by the study – Emer Bog SAC and The New Forest SAC – contain habitats for which their lower plant interest is an important part of the SAC feature. For these the lower critical level of 1 µg_m⁻³ is appropriate. Transects T1 to T8 are all on roads within 200m of The New Forest SAC, while transect T13 is on the most significant road within 200m of Emer Bog SAC. The lower critical level will be exceeded throughout all these transects in 2041, primarily due to background sources especially agriculture. However, in all cases the contribution of Test Valley Local Plan is either nominal (reported in the modelling as 0.00 because the contribution is too small to show) or slightly positive. This is likely to be due to a combination of distance between the road and the SAC (for example the closest road to Mottisfont Bats SAC forecast to receive an increase in traffic is 90m from the SAC at its closest), and redeployment of traffic on the network.

⁷⁸ As set out in the Air Quality Modelling Report, while the end of the plan period is 2040, one of the models used 2041 as an end date, so this is also the date used for the air quality modelling.

- 5.23 With regard to nitrogen deposition, all modelled designated sites are forecast to exceed their lowest critical load by 2041, due to existing sources such as existing traffic, point source emitters and agriculture. However, at no point is the contribution of Test Valley Local Plan forecast to be anything but nominal, being a maximum of 0.01 kgN/ha/yr at the closest point to the road and 0.00 kgN at greater distances (meaning too small to show in the model). As with ammonia, on a number of transects nitrogen deposition is forecast to slightly reduce due to the Test Valley Local Plan. The exception to this are Transects T10 and T11, the A303 passed Salisbury Plain SAC. The in combination nitrogen dose at this location is forecast to be approximately 0.3 kgN/ha/yr at the roadside, falling to 1% of the critical load by 30m from the roadside. The 'in combination' nitrogen deposition therefore cannot be dismissed. However, even here the contribution of Test Valley Local Plan is very small indeed, being a maximum of 0.05 kgN/ha/yr (0.5% of the critical load). Even allowing for 'in combination' nitrogen deposition a net improvement in nitrogen deposition is nonetheless forecast by 2041 (a reduction from 22.22 kgN/ha/yr in 2019 to 16.92 kgN/ha/yr), or an average of 0.25 kgN/ha/yr every year. Without any growth a net improvement of 5.58 kgN/ha/yr is forecast by 2041. With growth this reduces to 5.30 kgN/ha/yr. Therefore, the forecast 'in combination' nitrogen deposition will only retard the forecast improvement by the equivalent of approximately one year. This will not materially impede the achievement of the conservation objectives for the SAC.
- 5.24 The contribution of Test Valley Local Plan at Transect T12 (Mottisfont Bats SAC) is forecast to be 0.1 kgN/ha/yr (10% of the critical load) at the roadside of the B3084, which is the highest contribution of the Local Plan in the modelling, falling to 0.01 kgN/ha/yr by 40m from the roadside. This site is designated for its barbastelle population. While the woodland at the site is sensitive to nitrogen deposition, increases in nitrogen deposition are very unlikely to materially affect either the woodland structure or its foraging value, as the impact on woodlands generally amounts to changes in botanical species distribution of the groundflora and epiphytes.
- 5.25 In conclusion, no adverse effect on integrity is forecast for any European site as a result of the Local Plan alone or in combination with other plans or projects.

Water quantity, level and flow

- 5.26 The emerging Test Valley Local Plan will result in an increased demand for potable water, which will be delivered by Southern Water whose supply area covers Kent, Sussex, Hampshire and the Isle of Wight. The River Itchen SAC and Emer Bog SAC are both vulnerable to hydrological changes, which may occur due to increased dwellings within their hydrological catchment area if it is associated with increased abstraction. This particularly relates to the River Itchen SAC which the HRA of the Water Resource Management Plan of Southern Water identifies as being a major source of potable water for south Hampshire and also at high risk of adverse effects from additional abstraction.
- 5.27 The following site allocations have been included in the assessment of water quantity, level and flow:
- Land South of London Road, East Andover
 - Land at Bere Hill, South East Andover
 - Land at Manor Farm, North of Saxon Way, North Andover
 - Land east of Ludgershall
 - Land South East of Ludgershall
 - Land South of the Bypass, South Romsey
 - Land at Velmore Farm, Valley Park
 - Land South of Ganger Farm, East Romsey
 - Land at King Edwards Park, Ampfield
 - Land south of Thruxton Aerodrome
 - Land adjacent to Abbey Park, Romsey
 - South of Botley Road, Romsey
 - Kennels Farm, Extension to University of Southampton Science Park
 - Land at Upton Lane, Nursling

- Land at Test Valley Business Park, North Baddesley
 - Land at Bunny Lane, Romsey
- 5.28 Southern Water are currently undergoing consultation for their latest Water Resources Management Plan⁷⁹. The water strategy mentions they have entered into an operating agreement with the Environment Agency⁸⁰ which states “*Temporary Use Bans are required before implementation of the River Test Drought Permit and partial implementation of Non-essential Use Bans is required before the River Test or River Itchen Drought Orders are implemented.*” While the use of drought permits will allow Southern Water meet their water supply duty it may also pose a risk to rare and protected habitats and species reliant on these rivers. Annex 9 of the draft water resources management plan⁸¹ includes water abstraction plans with the aim of obtaining no deterioration of water sources.
- 5.29 Since these issues are addressed strategically by Southern Water based on robust population projections running long after the end of the Local Plan period no adverse effect on integrity from Local Plan allocations will arise.

Mitigation Contained in the Local Plan

- 5.30 Water quantity, level and flow is not explicitly covered in the Test Valley Local Plan. Policy CL4: Water Use and Management states ‘*Development should be designed to meet a higher level of water efficiency... Additionally, development will be permitted provided that... it does not result in a risk to the yield and quality of groundwater within a principle aquifer, including groundwater source protection zones, and there is no risk to water supplies...*’
- 5.31 The supporting text of Policy BIO2 specifically mentions ‘*additional assessments of possible changes to water flows...may be needed to ensure adverse effects are avoided*’ in relation to Emer Bog SAC.
- 5.32 Given the conclusion of the Southern Water WRMP and Drought Plan HRAs and the mitigation or (where appropriate) compensation measures identified for impacts on the River Itchen SAC, the Test Valley Local Plan will not have an adverse effect on the integrity of any European sites through this pathway.

Recreational pressure

- 5.33 The recreational catchments around these sites are specifically identified to capture all net new housing that will require mitigation. Therefore, further assessment is not required and instead the focus of this section is on mitigation.

Salisbury Plain SAC/SPA

- 5.34 The following site allocations are likely to increase recreational pressure on Salisbury Plain SAC/SPA without appropriate mitigation measures:
- Land east of Ludgershall
 - Land South East of Ludgershall
- 5.35 Wiltshire Council has produced a Mitigation Strategy which sets out measures to identify, avoid and mitigate any potential effects of increasing recreational pressure on the SPA. The Strategy was developed with the support of key partners including NE, RSPB and the Ministry of Defence (MoD). The Strategy broadly required the following measures:
- Annual stone curlew monitoring – Identifying and monitoring stone curlew nests throughout the nesting season. Carrying our analysis of the results and compiling monitoring information in an annual report.

⁷⁹ Southern Water (2022) Draft Water Resources Management Plan 2024. https://www.southernwater.co.uk/media/7597/southern_water_dwrmp24.pdf [accessed 05/01/2024]

⁸⁰ Section 20 of the Water Resources Act 1991

⁸¹ Southern Water (2022) Draft Water Resources Management Plan 2024. *Annex 9: Protecting and Enhancing the Environment.* https://www.southernwater.co.uk/media/8927/annex_9_protecting-and-enhancing-the-environment.pdf [accessed 05/01/2024]

- Advice to landowners / tenants – informing landowners and tenants about the presence and location of active nests on their land and advising them on how to carry out land management sensitively to avoid damaging / disturbing nests.
 - Visitor monitoring - monitoring the effects of additional housing on visitor activity, particularly in order to understand whether changes in breeding activity are related to recreational pressures or other factors. Visitor surveys would be carried out and reported on a quinquennial basis.
- 5.36 The HRA of the Wiltshire Housing Site Allocations Plan (WHSAP)⁸² notes that since 2002 there has been a steady increase in breeding success of stone curlew, measured as numbers of breeding pairs and number of young fledged per breeding pair and the period 2012-2017 also reflects this trend. The conservation target for the SPA is to maintain the breeding population at or above 15 pairs. Over the last ten years the number of pairs has remained fairly stable at around 24 and it can therefore be concluded that the SPA is in favourable condition in respect of this target. It notes that the revised Salisbury Plain SPA HRA and Mitigation Strategy concludes that the SPA remains in favourable condition and there is no evidence that increased visitor numbers are having an impact. The WHSAP HRA also notes that *‘For the time being the current strategy is adequate to support housing numbers proposed by the WHSAP in combination with other plans and projects as monitoring will ensure that any necessary review of mitigation measures will be timely’*. This is echoed in the Wiltshire Local Plan Review Habitat Regulations Assessment⁸³. Contributions to this strategy, agreed between the applicant, Test Valley Borough Council and Wiltshire Council would therefore appear to be the most appropriate mitigation solution.

New Forest SAC/SPA/Ramsar

- 5.37 The following site allocations are likely to increase recreational pressure on New Forest SAC/SPA/Ramsar without appropriate mitigation measures:

- Land South of the Bypass, South Romsey
- Land at Velmore Farm, Valley Park
- Land South of Ganger Farm, East Romsey
- Land at King Edwards Park, Ampfield
- Upton Lane, Nursling
- Land at Bunny Lane, Romsey

- 5.38 Mitigation measures within the Interim Mitigation Framework for New Forest SAC/SPA are as follows:

“a) Put forward evidence to justify that the proposal would not lead to a likely significant effect when considered alone, or in combination.

b) Develop a bespoke mitigation package for the proposal, which would need to be subject to site specific Habitats Regulations Assessment

c) Provide alternative natural green space for recreational use to a standard of 8ha per 1000 population, to be designed to divert visitors from the New Forest SPA⁸⁴

d) Provide a contribution of £1,300 per dwelling for off-site mitigation

The council would need to agree the proposed approach to mitigation. In addition to mitigation measures, a contribution towards monitoring measures would be required (payable on occupation), this has been factored into the figure provided for option d).”

⁸² Wiltshire Housing Site Allocations Plan, Adopted February 2020

⁸³ LUC (2023) Wiltshire Local Plan Review Habitat Regulations Assessment Appropriate Assessment.

https://www.wiltshire.gov.uk/media/11984/wlpr19-habitats-regulation-assessment-appropriate-assessment-sept-2023/pdf/wlpr19_habitats_regulation_assessment_appropriate_assessment_sept_2023.pdf?m=1695734045237 [accessed 05/01/2024]

⁸⁴ Such provisions would need to be designed seeking advice from the Borough Council and Natural England. The figure relates to the net area of usable space and is in addition to public open space requirements. This option is unlikely to be appropriate for smaller sites given the scale of provision it would be likely to generate.

5.39 The Council is also in the process of updating the mitigation framework⁸⁵. It is therefore considered that provisions / contributions to delivery of the latest mitigation solution would be the most appropriate mechanism to address recreational pressure effects on New Forest SAC/SPA/Ramsar.

Solent European sites

5.40 The following site allocations are likely to increase recreational pressure on the Solent European sites without appropriate mitigation measures:

- Land South of the Bypass, South Romsey
- Land at Velmore Farm, Valley Park

5.41 The Solent Recreation Mitigation Strategy delivered by Bird Aware Solent is the agreed mitigation solution for the Solent European sites. Mitigation measures and monitoring delivered as part of Bird Aware Solent are funded by developer contributions (varied depending on the number of bedrooms delivered) per net new residential dwelling delivered within the 5.6km catchment zone. The Bird Aware Solent Strategy proposes the following mitigation and monitoring measures to reduce the impact of recreational pressure:

- A team of 5-7 coastal rangers working to reduce disturbance
- Initiatives to encourage responsible dog walking in less sensitive parts of the coast
- Preparation of Codes of Conduct for high-impact recreational activities
- Tailored habitat management projects for specific sites
- A monitoring schemes to track the effectiveness of mitigation measures
- Providing alternative recreational greenspace (e.g. the Alver Valley Pilot Project)

5.42 Contributions to Bird Aware Solent are therefore the appropriate mechanism to mitigate recreational pressure through the Local Plan. Most recently, in 2023 an initial investigation was undertaken into whether breeding birds associated with the Solent European sites (namely Mediterranean gull, sandwich tern, common tern, little tern and roseate tern) were also sufficiently vulnerable to recreational disturbance that specific mitigation measures may also be required to address summer visitors. This is still being considered by the Partnership for South Hampshire but it is assumed for the purposes of this HRA that if such measures are needed they could be addressed through an expansion of Bird Aware Solent into the summer and through the incorporation of measures specific to these nesting species informed by an uplift to the tariff currently charged.

Mitigation Contained in the Local Plan

5.43 The Test Valley Local Plan Policy BIO2: International Nature Conservation Designations states '*Development that is likely to have a significant effect, either alone or in-combination, on an international nature conservation designation will be required to clearly demonstrate that any potential adverse effects on the integrity of such designations are fully mitigated. This includes... recreational impacts on the New Forest designations, Solent designations and Salisbury Plain SPA.*'

5.44 The supporting text for Policy BIO2 mentions the Solent Recreation Mitigation Strategy⁸⁶ which is in place for the Solent European sites. It also indicates that the Council is working with partners on a co-ordinated strategic approach for recreational impacts on the New Forest, which is likely to result in a package of measures including Suitable Alternative Natural Greenspace and on-designation mitigation and monitoring.

5.45 The supporting text for Policy BIO2 states the Test Valley Council are currently working with Wiltshire Council to explore mitigation options for recreational impacts on the Salisbury Plain SAC and SPA. A bespoke mitigation scheme is suggested as a potential solution to satisfy legal requirements.

5.46 The Northern Area Policy 8 (NA8): Land to the East of Ludgershall and Northern Area Policy 9 (NA9): Land to the South East of Ludgershall both state '*Development will be permitted subject to...appropriate mitigation in relation to the Salisbury Plain Special Protection Area (SPA)*'.

⁸⁵ Test Valley Borough Council (2021) Draft New Forest International Conservation Designations: Recreational Mitigation Framework Supplementary Planning Document

⁸⁶The Solent Recreation Mitigation Partnership (2017) Solent Recreation Mitigation Strategy

- 5.47 Southern Area Policy 4 (SA4): Land South of Ganger Farm, Romsey mentions specifically that ‘*development with be permitted subject to...provision of Suitable Alternative Natural Green Space (SANG) in relation to the New Forest Special Protection Area (SPA), Special Area of Conservation (SAC) and Ramsar Site*’.
- 5.48 Southern Area Policy 5 (SA5): Land South of the Bypass, Romsey states ‘*Development will be permitted subject to:...Appropriate mitigation in relation to the Solent Special Protection Area (SPA)... Provision of Sustainable Alternative Natural Greenspace (SANG) in relation to the New Forest Special Protection Area (SPA), Special Area of Conservation (SAC) and Ramsar Site.*’
- 5.49 Southern Area Policy 7 (SA7): Land at King Edward Park, Ampfield states the requirement for mitigation for recreational pressure on the New Forest SPA/SAC/Ramsar site will be confirmed at Regulation 19 Stage.

Recommendations

- 5.50 The supporting text for BIO2 should also identify the agreed recreational mitigation solution for Salisbury Plain SPA and SAC when it is confirmed. Subject to further investigation, this may comprise contributions to Wiltshire Council’s mitigation scheme.**

Functionally-linked land (Mottisfont Bats SAC)

- 5.51 The following site allocations are potentially functionally linked to the Mottisfont Bats SAC as they are within the core sustenance zone of 7.5km:
- Land South of the Bypass, South Romsey
 - Land South of Ganger Farm, East Romsey
 - Land at Bunny Lane, Romsey
- 5.52 An Appropriate Assessment of this impact pathway requires an appraisal of the following key aspects:
- The distance between the SAC and each allocation (already undertaken);
 - The flightlines and habitats located between the SAC and the location (i.e. are bats likely to actually reach the site along linear landscape features); and
 - The habitat type in potential site allocations (i.e. would potential foraging areas, such as semi-natural wet grassland and riparian habitat, be lost).
- 5.53 The habitat between Mottisfont Bats SAC and Land South of the Bypass, South Romsey is predominantly agricultural. Green corridors such as the River Test and the railway line between Romsey Station and Dunbridge, as well as hedgerow boundaries provide suitable connective habitat for bats. There is woodland habitat located on the western and southern borders of the site allocation that joins to the River Test. This woodland contributes to the Mottisfont Bats SAC Functionally Linked Land (FLL).
- 5.54 The habitat between Mottisfont Bats SAC and Land South of Ganger Farm, East Romsey is predominantly agricultural. Green corridors such as the River Test and the railway line between Chandler’s Ford and Dunbridge, as well as hedgerow boundaries provide suitable connective habitat for bats. Romsey town also lies between Land South of Ganger Farm, East Romsey and Mottisfont Bats SAC. The largely built-up urban areas in Romsey town provides less suitable connective habitat due to increased noise and light pollution however the railway line present may provide a green corridor through Romsey town to Land South of Ganger Farm, East Romsey. Ganger Wood is an ancient woodland and Site of Importance for Nature Conservation located within the Land South of Ganger Farm site allocation. This woodland contributes to the Mottisfont Bats SAC FLL.
- 5.55 The habitat between Mottisfont Bats SAC and Land at Bunny Lane, Romsey is predominantly agricultural. Green corridors such as the River Test and the railway line between Romsey Station and Dunbridge, as well as hedgerow boundaries provide suitable connective habitat for bats. Woodland habitat located on the southern and eastern borders of the site allocation contributes to the Mottisfont Bats SAC FLL.

Mitigation Contained in the Local Plan

- 5.56 Southern Area Policy 4 (SA4): Land South of Ganger Farm, East Romsey mentions specifically that ‘*development with be permitted subject to... Appropriate mitigation in relation to the Mottisfont Bats Special*

Area of Conservation (SAC) in accordance with Policy BIO2'. The supporting text for this policy highlights that Ganger Wood is present within the site allocation and that the masterplan would need to 'reinforce, protect and enhance green infrastructure networks and ensure the SAC foraging area is preserved and that the Ganger Wood Ancient Woodland and SINC and other woodland areas are appropriately protected. This includes ensuring the appropriate level of darkness is retained.'

- 5.57 Southern Area Policy 5 (SA5): Land South of the Bypass, South Romsey states 'Development will be permitted subject to:... Appropriate mitigation in relation to the Mottisfont Bats Special Area of Conservation (SAC),'. The supporting text identifies that there are habitats on site which contribute to the Mottisfont Bats SAC FLL and highlights the presence of mature trees, protected by Tree Preservation Orders. The supporting text echoes the aforementioned masterplan requirements of SA4.
- 5.58 The Test Valley Local Plan has acknowledged the potential impacts that development at Land South of Ganger Farm, East Romsey and Land South of the Bypass, South Romsey may have on Mottisfont Bat SAC FLL and has provided mitigation requirements to protect suitable FLL. The Test Valley Local Plan will not cause a likely significant effects to FLL for these two sites.
- 5.59 The supporting text in Housing Policy 8 (HOU8): Meeting the needs of Gypsies, Traveller and Travelling Showpeople includes text stating that the requirements set out in Appendix 3 will apply to the Land at Bunny Lane, as it is within the zone of influence of Mottisfont Bats SAC. Appendix 3 links back to the requirement for appropriate mitigation in line with BIO1-3.

Recommendation

- 5.60 The text within the Test Valley Local Plan suitably considers and mitigates the effects of the relevant site allocations.

In combination effects

- 5.61 It is a requirement of HRA that effects are considered 'in combination' rather than purely in isolation. To a large extent in combination effects are captured by the recreational or other catchments identified around the SACs and SPAs discussed in the appropriate assessment. For example, the purpose of the recreational catchments identified around New Forest SAC/SPA, Salisbury Plain SPA and the Solent European sites is explicitly to capture the large number of small developments which will have no effect on these sites by themselves but collectively amount to an adverse effect on integrity without mitigation. The same is true for the surface water catchments around Emer Bog SAC, the Solent European sites and the River Itchen SAC, and the functionally-linked land catchment around Mottisfont Bats SAC. Therefore, in combination effects have effectively already been captured in the HRA from growth in Test Valley in combination with growth in the following other Local Plans:

- New Forest Local Plan 2016-2036: Part 1 Planning Strategy Adopted 2020⁸⁷ which sets the target to provide at least 10,420 additional homes in Policy STR5: Meeting our housing needs,
- Wiltshire Core Strategy Adopted 2015⁸⁸ which sets the indicative housing requirement target for Wiltshire at 42,000 homes in Core Policy 2: Delivery strategy.
- Wiltshire is also currently working on an emerging Local Plan Review which went to pre-submission consultation on 27th September 2023⁸⁹ and will update the housing numbers and employment land requirements in Wiltshire.
- Basingstoke and Deane Local Plan 2011-2029 Adopted 2016⁹⁰ which outlines the provision of 15,300 new dwellings in Policy SS1 – Scale and Distribution of New Housing.
- Eastleigh Local Plan 2016-2036 Adopted 2022⁹¹ which has identified the minimum requirement of dwellings for Eastleigh to be 14,580 in Strategic Policy S2, Approach to new development.
- Southampton City Centre Action Plan, Adopted 2015⁹² outlines a requirement for 5,450 dwellings in Policy AP 9 Housing Supply.

⁸⁷ [Local Plan 2016-2036 Part One FINAL.pdf \(newforest.gov.uk\)](#); Accessed 13/04/2023

⁸⁸ [untitled \(wiltshire.gov.uk\)](#); Accessed 13/04/2023

⁸⁹ [Wiltshire Local Plan Pre-Submission Consultation - Keyplan](#); Accessed 01/12/2023

⁹⁰ [Adopted Local Plan 2011-2029 \(basingstoke.gov.uk\)](#) Accessed 16/01/2023

⁹¹ [Local Plan | Eastleigh Borough Council](#) Accessed 16/01/2023

⁹² [Adopted development plans \(southampton.gov.uk\)](#) Accessed 16/01/2023

- The emerging Southampton City Local Plan⁹³ has increased the requirement from Policy AP 9 to 16,800 dwellings.
- Winchester Local Plan Part 1: Joint Core Strategy Adopted 2013⁹⁴ includes the requirement for 12,500 new dwellings in Policy DS1 – Development Strategy and Principles.
- And for the Solent European sites, all other Local Plans within the surface water catchment of the Rivers Test and Itchen, and within 5.6km of the Solent European sites, such as those for Havant, Portsmouth, East Hampshire, South Downs National Park and Chichester.

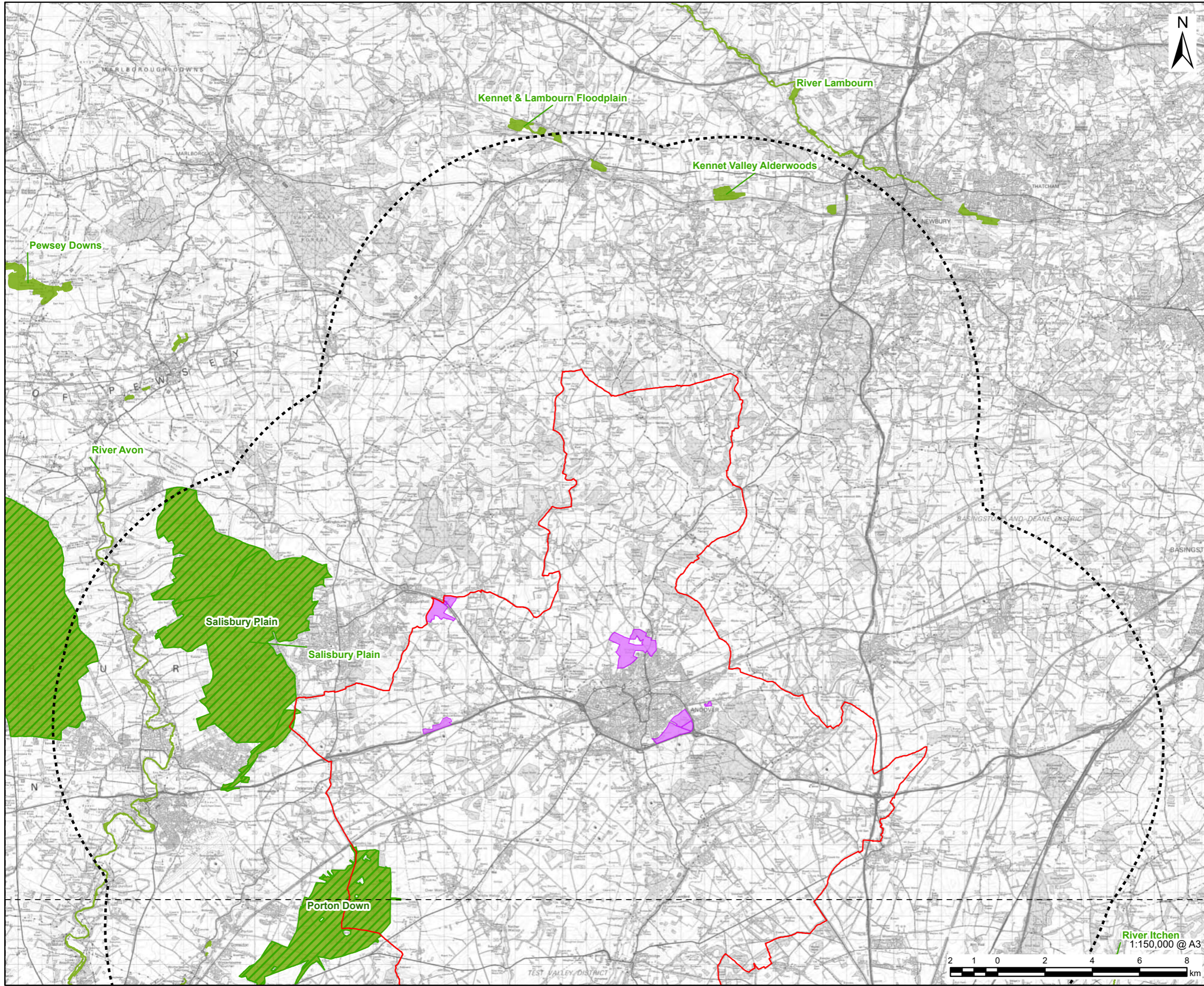
6. Conclusion

- 6.1 With the inclusion of the recommendations in this report, it is considered that the Test Valley Local Plan would contain a sufficient policy framework to protect all European sites from adverse effects on integrity, either alone or in combination with other plans and projects. Such recommendations should be addressed prior to the submission of the Local Plan for examination.

⁹³ [Draft Plan with Options \(southampton.gov.uk\)](https://www.southampton.gov.uk) Accessed 13/04/2023

⁹⁴ [Local Plan - Winchester City Council](#): Accessed 13/04/2023

Appendix A Figures



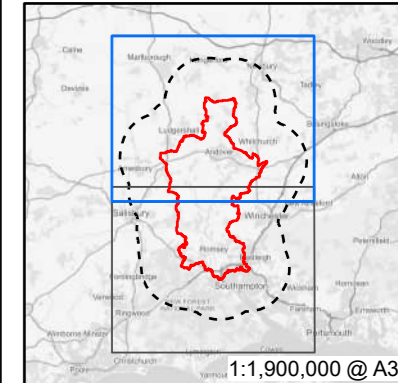
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- LEGEND**
- Test Valley District
 - Assessment Site
 - Ramsar
 - Special Protection Area (SPA)
 - Special Area of Conservation (SAC)



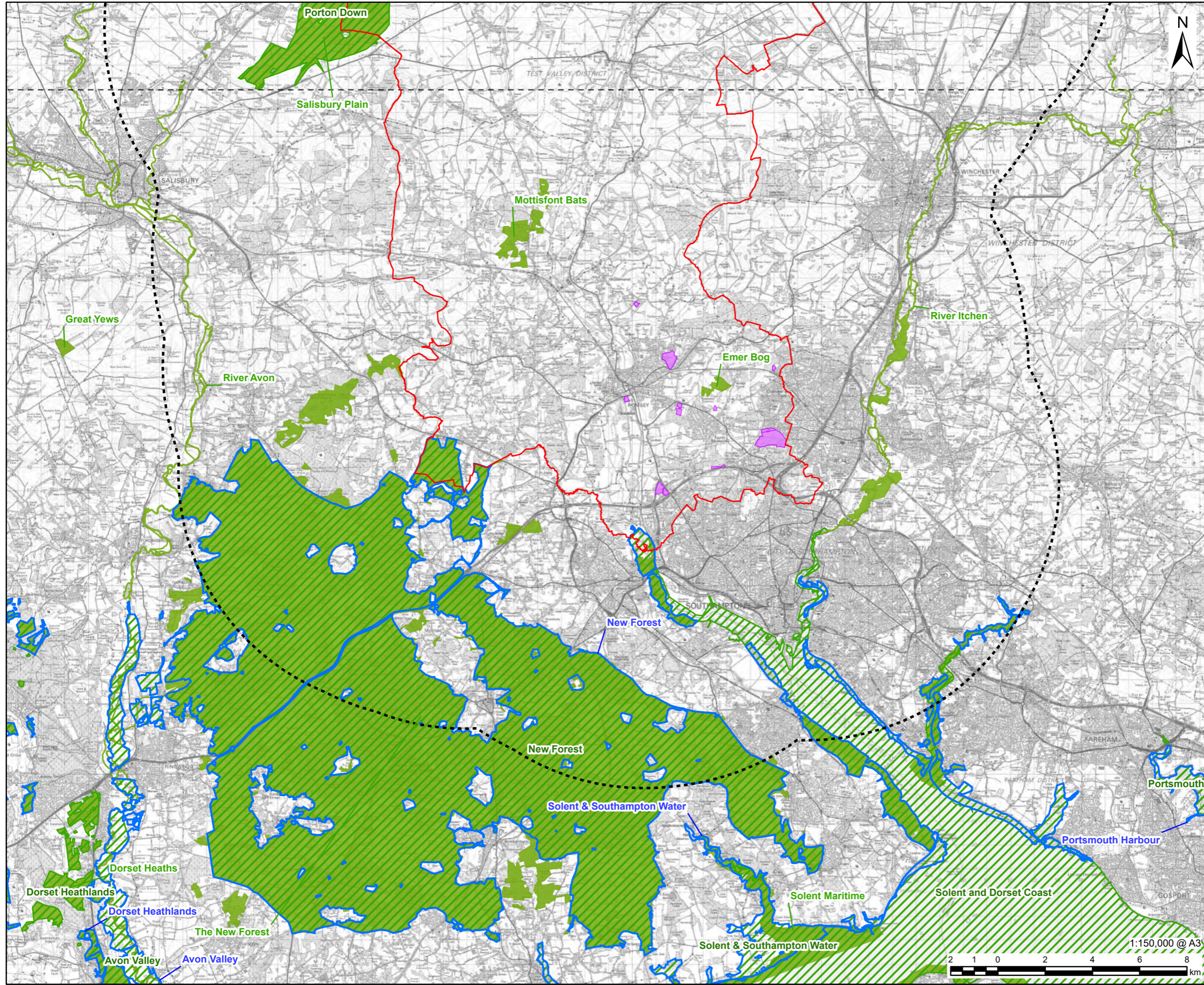
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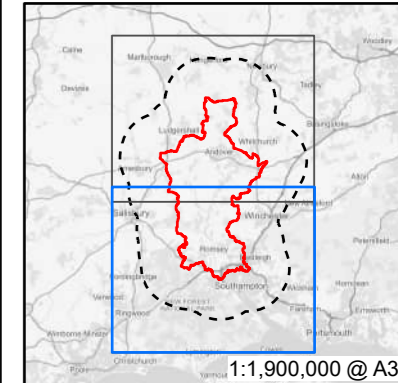
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Appendix B Background to European Sites and Map

B.1 Mottisfont Bats SAC

Conservation Objectives⁹⁵

With regard to the SAC and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change.

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contribute to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring:

- The extent and distribution of the habitats of qualifying species
- The structure and function of the habitats of qualifying species
- The supporting processes on which the habitats of qualifying species rely
- The populations of qualifying species, and,
- The distribution of qualifying species within the site.

Qualifying Features⁹⁶

The following features are reasons for designation as an SAC:

Annex II species that are a primary reason for selection of this site

- Barbastelle bats (*Barbastella barbastellus*)

Environmental Vulnerabilities⁹⁷

The threats and pressures likely to affect the SAC are listed below:

- Feature location/ extent/ condition unknown
- Forestry and woodland management
- Offsite habitat availability/ management

B.2 Emer Bog SAC

Conservation Objectives⁹⁸

With regard to the SAC and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change.

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contribute to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- The extent and distribution of the qualifying natural habitat
- The structure and function (including typical species) of the qualifying natural habitat, and,

⁹⁵ [European Site Conservation Objectives for Mottisfont Bats SAC - UK0030334 \(naturalengland.org.uk\)](#) (Assessed 23/02/2022)

⁹⁶ [Mottisfont Bats - Special Areas of Conservation \(incc.gov.uk\)](#) (Assessed 23/02/2022)

⁹⁷ [European Site Conservation Objectives for Mottisfont Bats SAC - UK0030334 \(naturalengland.org.uk\)](#) (Assessed 23/02/2022)

⁹⁸ [European Site Conservation Objectives for Emer Bog SAC - UK0030147 \(naturalengland.org.uk\)](#) (Assessed 23/02/2022)

- The supporting processes on which the qualifying natural habitat rely

Qualifying Features⁹⁹

The following features are reasons for designation as an SAC:

Annex I habitats that are primary reason for selection of this site:

- Transition mires and quaking bogs

Environmental Vulnerabilities¹⁰⁰

The threats and pressures likely to affect the SAC are listed below:

- Public access / disturbance
- Hydrological changes
- Air pollution: impact of atmospheric nitrogen deposition

B.3 River Itchen SAC

Conservation Objectives¹⁰¹

With regard to the SAC and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change.

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contribute to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- The extent and distribution of qualifying natural habitats and habitats of qualifying species
- The structure and function (including typical species) of qualifying natural habitats
- The structure and function of the habitats of qualifying species
- The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely
- The populations of qualifying species, and,
- The distribution of qualifying species within the site.

Qualifying Features¹⁰²

The following features are reasons for designation as an SAC:

Annex I habitats that are primary reason for selection of this site:

- Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitriche-Batrachion* vegetation

Annex II species that are a primary reason for selection of this site:

- Southern damselfly (*Coenagrion mercuriale*)
- Bullhead (*Cottus gobio*)

Annex II species present as a qualifying feature, but not a primary reason for site selection:

- White-clawed (or Atlantic stream) crayfish (*Austropotamobius pallipes*)
- Brook lamprey (*Lampetra planeri*)
- Atlantic salmon (*Salmo salar*)
- Otter (*Lutra lutra*)

⁹⁹ [Emer Bog - Special Areas of Conservation \(jncc.gov.uk\)](https://www.jncc.gov.uk/publications/6367668705689600) (Assessed 23/02/2022)

¹⁰⁰ [http://publications.naturalengland.org.uk/publication/6367668705689600](https://publications.naturalengland.org.uk/publication/6367668705689600) (Assessed 23/02/2022)

¹⁰¹ [http://publications.naturalengland.org.uk/publication/5130124110331904](https://publications.naturalengland.org.uk/publication/5130124110331904) (Assessed 23/02/2022)

¹⁰² [River Itchen - Special Areas of Conservation \(jncc.gov.uk\)](https://www.jncc.gov.uk/publications/5130124110331904) (Assessed 23/02/2022)

Environmental Vulnerabilities¹⁰³

The threats and pressures likely to affect the SAC are listed below:

- Water pollution
- Physical modification
- Siltation
- Overgrazing
- Water abstraction
- Inappropriate weed control
- Hydrological changes
- Inappropriate water levels
- Change in land management
- Inappropriate cutting / mowing
- Invasive species
- Undergrazing
- Inappropriate ditch management
- Inappropriate scrub control
- Forestry and woodland management

B.4 The New Forest SAC

Conservation Objectives¹⁰⁴

With regard to the SAC and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change.

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contribute to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- The extent and distribution of qualifying natural habitats and habitats of qualifying species
- The structure and function (including typical species) of qualifying natural habitats
- The structure and function of the habitats of qualifying species
- The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely
- The populations of qualifying species, and,
- The distribution of qualifying species within the site.

Qualifying Features¹⁰⁵

The following features are reasons for designation as an SAC:

Annex I habitats that are primary reason for selection of this site:

- Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*)
- Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoëto-Nanojuncetea*

¹⁰³ publications.naturalengland.org.uk/file/5665158219169792 (Assessed 23/02/2022)

¹⁰⁴ [European Site Conservation Objectives for The New Forest SAC - UK0012557 \(naturalengland.org.uk\)](https://publications.naturalengland.org.uk/file/5665158219169792) (Assessed 23/02/2022)

¹⁰⁵ <https://sac.incc.gov.uk/site/UK0012557> (Assessed 23/02/2022)

- Northern Atlantic wet heaths with *Erica tetralix*
- European dry heaths
- Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*)
- Depressions on peat substrates of the *Rhynchosporion*
- Atlantic acidophilous beech forests with Ilex and sometimes also Taxus in the shrublayer (*Quercion robori-petraeae* or *Ilici-Fagenion*)
- Asperulo-Fagetum beech forests
- Old acidophilous oak woods with *Quercus robur* on sandy plains
- Bog woodland
- Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*)

Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:

- Transition mires and quaking bogs
- Alkaline fens

Annex II species that are a primary reason for selection of this site

- Southern damselfly (*Coenagrion mercurial*)
- Stag beetle (*Lucanus cervus*)

Annex II species present as a qualifying feature, but not a primary reason for site selection:

- Great crested newts (*Triturus cristatus*)

Environmental Vulnerabilities¹⁰⁶

The threats and pressures likely to affect the SAC are listed below:

- Drainage
- Inappropriate scrub control
- Fish stocking
- Deer
- Air pollution
- Public access/disturbance
- Change in land management
- Change in species distribution
- Water pollution
- Forestry and woodland management
- Inappropriate ditch management
- Invasive species
- Vehicles
- Inappropriate cutting/mowing
- Direct impact from third party

¹⁰⁶ <http://publications.naturalengland.org.uk/publication/5174614971908096> (Assessed 23/02/2022)

B.5 New Forest SPA and Ramsar

Conservation Objectives¹⁰⁷

With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change;

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;

- The extent and distribution of the habitats of the qualifying features
- The structure and function of the habitats of the qualifying features
- The supporting processes on which the habitats of the qualifying features rely
- The population of each of the qualifying features, and,
- The distribution of the qualifying features within the site.

Qualifying Features

The following features are reasons for designation as an SPA:

- European honey buzzard (*Pernis apivorus*)
- Hen harrier (*Circus cyaneus*)
- Eurasian hobby (*Falco subbuteo*)
- European nightjar (*Caprimulgus europaeus*)
- Woodlark (*Lullula arborea*)
- Dartford warbler (*Sylvia undata*)
- Wood warbler (*Phylloscopus sibilatrix*)

The following features are reasons for designation as a Ramsar¹⁰⁸:

Criterion 1

- Valley mires and wet heaths are found throughout the site and are of outstanding scientific interest. The mires and heaths are within catchments whose uncultivated and undeveloped state buffer the mires against adverse ecological change. This is the largest concentration of intact valley mires of their type in Britain.

Criterion 2

- The site supports a diverse assemblage of wetland plants and animals including several nationally rare species. Seven species of nationally rare plant are found on the site, as are at least 65 British Red Data Book species of invertebrate.

Criterion 3

- The mire habitats are of high ecological quality and diversity and have undisturbed transition zones. The invertebrate fauna of the site is important due to the concentration of rare and scarce wetland species. The whole site complex, with its examples of semi-natural habitats is essential to the genetic and ecological diversity of southern England.

¹⁰⁷ <http://publications.naturalengland.org.uk/file/4908493534658560> (Accessed 27/04/2022)

¹⁰⁸ [Information Sheet on Ramsar Wetlands - The New Forest \(jncc.gov.uk\)](https://www.jncc.gov.uk/information-sheet-on-ramsar-wetlands-the-new-forest) (Accessed 27/04/22)

Environmental Vulnerabilities

The threats and pressures likely to affect the SPA are listed below:

- Drainage
- Inappropriate scrub control
- Fish stocking
- Deer
- Air pollution
- Public access/disturbance
- Change in land management
- Change in species distribution
- Water pollution
- Forestry and woodland management
- Inappropriate ditch management
- Invasive species
- Vehicles
- Inappropriate cutting/mowing
- Direct impact from 3rd party

B.6 Salisbury Plain SAC

Conservation Objectives¹⁰⁹

With regard to the SAC and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change.

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contribute to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- The extent and distribution of qualifying natural habitats and habitats of qualifying species
- The structure and function (including typical species) of qualifying natural habitats
- The structure and function of the habitats of qualifying species
- The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely
- The populations of qualifying species, and,
- The distribution of qualifying species within the site.

Qualifying Features¹¹⁰

The following features are reasons for designation as an SAC:

Annex I habitats that are primary reason for selection of this site:

- *Juniperus communis* formations on heaths or calcareous grasslands
- Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites)

Annex II species present are a primary reason for selection of this site:

¹⁰⁹ [European Site Conservation Objectives for Salisbury Plain SAC - UK0012683 \(naturalengland.org.uk\)](#) (Assessed 23/02/2022)

¹¹⁰ <https://sac.incc.gov.uk/site/UK0012683> (Assessed 23/02/2022)

- Marsh fritillary butterfly (*Euphydryas aurinia*)

Environmental Vulnerabilities¹¹¹

The threats and pressures likely to affect the SAC are listed below:

- Change in species distributions
- Air pollution: risk of atmospheric nitrogen deposition

B.7 Salisbury Plain SPA

Conservation Objectives¹¹²

With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change;

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;

- The extent and distribution of the habitats of the qualifying features
- The structure and function of the habitats of the qualifying features
- The supporting processes on which the habitats of the qualifying features rely
- The population of each of the qualifying features, and,
- The distribution of the qualifying features within the site.

Qualifying Features

The following features are reasons for designation as an SPA:

Regularly supporting nationally important populations of Annex I Species:

- 10% of the British breeding population of stone curlew (*Burhinus oedicnemus*)
- 1% of the British wintering population of hen harrier (*Circus cyaneus*)

Supporting nationally important breeding populations of regularly occurring migratory species:

- 20% of the British population of quail (*Coturnix coturnix*)
- 1% of the British population of hobby (*Falco subbuteo*)

Environmental Vulnerabilities¹¹³

The threats and pressures likely to affect the SPA are listed below:

- Change in species distributions
- Air pollution: risk of atmospheric nitrogen deposition

B.8 Porton Down SPA

Conservation Objectives¹¹⁴

With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change.

¹¹¹ <http://publications.naturalengland.org.uk/publication/5384236060114944?category=23039> (Assessed 23/02/2022)

¹¹² [European Site Conservation Objectives for Salisbury Plain SPA - UK9011102 \(naturalengland.org.uk\)](#) (Assessed 18/01/2023)

¹¹³ [Site Improvement Plan: Salisbury Plain - SIP209 \(naturalengland.org.uk\)](#) (Assessed 18/01/2023)

¹¹⁴ [European Site Conservation Objectives for Porton Down SPA - UK9011101 \(naturalengland.org.uk\)](#) (Assessed 23/02/2022)

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;

- The extent and distribution of the habitats of the qualifying features
- The structure and function of the habitats of the qualifying features
- The supporting processes on which the habitats of the qualifying features rely
- The population of each of the qualifying features, and,
- The distribution of the qualifying features within the site

Qualifying Features

The following features are reasons for designation as an SPA

- Stone-curlew (*Burhinus oedicnemus*)

Environmental Vulnerabilities

The threats and pressures likely to affect the SPA are listed below:

- Population abundance
- Extent and distribution of supporting breeding habitat
- Predation
- Air quality
- Vegetation characteristics
- Food availability within supporting habitat
- Landscape
- Connectivity with supporting habitats
- Disturbance caused by human activity

B.9 Solent Maritime SAC

Conservation Objectives¹¹⁵

With regard to the SAC and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change.

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contribute to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- The extent and distribution of qualifying natural habitats and habitats of qualifying species
- The structure and function (including typical species) of qualifying natural habitats
- The structure and function of the habitats of qualifying species
- The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely
- The populations of qualifying species, and,
- The distribution of qualifying species within the site.

Qualifying Features¹¹⁶

The following features are reasons for designation as an SAC:

¹¹⁵ <http://publications.naturalengland.org.uk/file/5336347464433664> (Assessed 14/03/2022)

¹¹⁶ [Solent Maritime - Special Areas of Conservation \(incc.gov.uk\)](http://www.incc.gov.uk/Solent-Maritime-Special-Areas-of-Conservation) (Assessed 14/03/2022)

Annex I habitats that are a primary reason for selection of this site:

- Estuaries
- Spartina swards (*Spartinion maritimae*)
- Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)

Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:

- Sandbanks which are slightly covered by sea water all the time
- Mudflats and sandflats not covered by seawater at low tide
- Coastal lagoons * Priority feature
- Annual vegetation of drift lines
- Perennial vegetation of stony banks
- Salicornia and other annuals colonizing mud and sand
- "Shifting dunes along the shoreline with *Ammophila arenaria* ("white dunes")"

Annex II species present as a qualifying feature, but not a primary reason for site selection:

- Desmoulin's whorl snail (*Vertigo moulinsiana*)

Environmental Vulnerabilities¹¹⁷

The threats and pressures likely to affect the SAC are listed below:

- Public Access/Disturbance
- Coastal squeeze
- Fisheries: Commercial marine and estuarine
- Water Pollution
- Changes in species distributions
- Climate change
- Change to site conditions
- Invasive species
- Direct land take from development
- Biological Resource Use
- Change in land management
- Inappropriate pest threat control
- Air Pollution: impact of atmospheric nitrogen deposition
- Hydrological changes
- Direct impact from third Threat party
- Extraction: non-living resources

B.10 Solent & Southampton Water SPA

Conservation Objectives¹¹⁸

With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change.

¹¹⁷ <http://publications.naturalengland.org.uk/file/5319610920337408> (Assessed 14/03/2022)

¹¹⁸ <http://publications.naturalengland.org.uk/file/5932771361161216> (Assessed 14/03/2022)

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;

- The extent and distribution of the habitats of the qualifying features
- The structure and function of the habitats of the qualifying features
- The supporting processes on which the habitats of the qualifying features rely
- The population of each of the qualifying features, and,
- The distribution of the qualifying features within the site.

Qualifying Features¹¹⁹

The following features are reasons for designation as an SPA:

- Dark-bellied brent goose (Non-breeding) *Branta bernicla bernicla*;
- Eurasian teal (Non-breeding) *Anas crecca*;
- Ringed plover (Non-breeding) *Charadrius hiaticula*;
- Black-tailed godwit (Non-breeding) *Limosa limosa islandica*;
- Mediterranean gull (Breeding) *Larus melanocephalus*;
- Sandwich tern (Breeding) *Sterna sandvicensis*;
- Roseate tern (Breeding) *Sterna dougallii*;
- Common tern (Breeding) *Sterna hirundo*;
- Little tern (Breeding) *Sterna albifrons*;

Environmental Vulnerabilities¹²⁰

The threats and pressures likely to affect the SPA are listed below:

- Public Access/Disturbance
- Coastal squeeze
- Fisheries: Commercial marine and estuarine
- Water Pollution
- Changes in species distributions
- Climate change
- Change to site conditions
- Invasive species
- Direct land take from development
- Biological Resource Use
- Change in land management
- Inappropriate pest Threat control
- Air Pollution: impact of atmospheric nitrogen deposition
- Hydrological changes
- Direct impact from 3rd Threat party
- Extraction: non-living resources

¹¹⁹ <http://publications.naturalengland.org.uk/file/5932771361161216> (Assessed 14/03/2022)

¹²⁰ <http://publications.naturalengland.org.uk/file/5319610920337408> (Assessed 14/03/2022)

B.11 Solent and Dorset Coast SPA

Conservation Objectives¹²¹

With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change.

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;

- The extent and distribution of the habitats of the qualifying features
- The structure and function of the habitats of the qualifying features
- The supporting processes on which the habitats of the qualifying features rely
- The population of each of the qualifying features, and,
- The distribution of the qualifying features within the site.

Qualifying Features¹²²

The following features are reasons for designation as an SPA:

- Sandwich tern (*Sterna sandvicensis*) Breeding
- Common tern (*Sterna hirundo*) Breeding
- Little tern (*Sternula albifrons*) Breeding

Environmental Vulnerabilities¹²³

The threats and pressures likely to affect the SPA are listed below:

- Public Access/Disturbance
- Coastal squeeze
- Fisheries: Commercial marine and estuarine
- Water Pollution
- Changes in species distributions
- Climate change
- Change to site conditions
- Invasive species
- Direct land take from development
- Biological Resource Use
- Change in land management
- Inappropriate pest Threat control
- Air Pollution: impact of atmospheric nitrogen deposition
- Hydrological changes
- Direct impact from third Threat party
- Extraction: non-living resources

¹²¹ <http://publications.naturalengland.org.uk/file/6374193567629312> (Assessed 14/03/2022)

¹²² <http://publications.naturalengland.org.uk/file/6374193567629312> (Assessed 14/03/2022)

¹²³ <http://publications.naturalengland.org.uk/file/5319610920337408> (Assessed 14/03/2022)

B.12 Kennet Valley Alderwoods SAC

Conservation Objectives¹²⁴

With regard to the SAC and the natural habitats and/or species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change.

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contribute to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- The extent and distribution of the qualifying natural habitat
- The structure and function (including typical species) of the qualifying natural habitat, and,
- The supporting processes on which the qualifying natural habitat rely

Qualifying Features

The following features are reasons for designation as an SAC:

Annex I habitats that are primary reason for selection of this site:

- Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*). (Alder woodland on floodplains)

Environmental Vulnerabilities¹²⁵

The threats and pressures likely to affect the SAC are listed below:

- Inappropriate water levels
- Game management

B.13 Kennet & Lambourn Floodplain SAC

Conservation Objectives¹²⁶

With regard to the SAC and the natural habitats and/or species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change.

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contribute to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- The extent and distribution of the qualifying natural habitat
- The structure and function (including typical species) of the qualifying natural habitat, and,
- The supporting processes on which the qualifying natural habitat rely

Qualifying Features

The following features are reasons for designation as an SAC:

Annex II species that are a primary reason for selection of this site

- Desmoulin's whorl snail (*Vertigo moulinsiana*)

¹²⁴ [European Site Conservation Objectives for Kennet Valley Alderwoods SAC - UK0030175 \(naturalengland.org.uk\)](#) (Assessed 18/01/2023)

¹²⁵ [Site Improvement Plan: Kennet Valley Alderwoods - SIP113 \(naturalengland.org.uk\)](#) (Assessed 18/01/2023)

¹²⁶ [European Site Conservation Objectives for Kennet & Lambourn Floodplain SAC - UK0030044 \(naturalengland.org.uk\)](#) (Assessed 18/01/2023)

Environmental Vulnerabilities¹²⁷

The threats and pressures likely to affect the SAC are listed below:

- Siltation
- Water Pollution
- Invasive species
- Hydrological changes
- Inland flood defence works
- Inappropriate cutting/mowing
- Change in land management
- Inappropriate water levels

B.14 River Avon SAC

Conservation Objectives¹²⁸

With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change;

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- The extent and distribution of qualifying natural habitats and habitats of qualifying species
- The structure and function (including typical species) of qualifying natural habitats
- The structure and function of the habitats of qualifying species
- The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely
- The populations of qualifying species, and,
- The distribution of qualifying species within the site.

Qualifying Features

- Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitriche-Batrachion* vegetation; Rivers with floating vegetation often dominated by water-crowfoot
- *Vertigo moulinsiana*; Desmoulin's whorl snail
- *Petromyzon marinus*; Sea lamprey
- *Lampetra planeri*; Brook lamprey
- *Salmo salar*; Atlantic salmon
- *Cottus gobio*; Bullhead

Environmental Vulnerabilities¹²⁹

- Physical modification

¹²⁷ [Site Improvement Plan: River Lambourn and Kennet-Lambourn Floodplain - SIP112 \(naturalengland.org.uk\)](#) (Assessed 18/01/2023)

¹²⁸ <https://publications.naturalengland.org.uk/file/5809608165949440> [Accessed 17/05/2023]

¹²⁹ <https://publications.naturalengland.org.uk/file/6247102287970304> [Accessed 17/03/2023]

- Siltation
- Water pollution
- Water abstraction
- Changes in species distributions
- Invasive species
- Hydrological changes
- Inappropriate weed control
- Change in land management
- Habitat fragmentation

Appendix C Air Quality Modelling Results

Air Quality Results

The results for both modelled future Do Something (with the Local Plan) scenarios are presented, although the results are virtually identical between the two scenarios with only the occasional small difference in the second decimal place.

The transects relate to the following European sites:

T1 to T8 = New Forest SAC/SPA

T9 to T11 = Salisbury Plain SAC

T12 = Mottisfont Bats SAC

T13 = Emer Bog SAC

T14 to T16 = Solent Maritime SAC

Transect	Distance from road	NOx					Ammonia					Nitrogen deposition				
		2019 baseline	2041 Future Base (no growth)	2041 DM (without Local Plan)	2041 DS1 (Local Plan added scenario 1)	2041 DS2 (Local Plan added scenario 2)	2019 baseline	2041 Future Base (no growth)	2041 DM (without Local Plan)	2041 DS1 (Local Plan added scenario 1)	2041 DS2 (Local Plan added scenario 2)	2019 baseline	2041 Future Base (no growth)	2041 DM (without Local Plan)	2041 DS1 (Local Plan added scenario 1)	2041 DS2 (Local Plan added scenario 2)
T1_21m	1m	38.76	10.59	10.88	10.89	10.90	2.09	1.58	1.67	1.66	1.66	33.95	24.74	25.47	25.43	25.43
T1_30m	10m	33.98	10.39	10.62	10.63	10.64	1.92	1.51	1.58	1.58	1.58	31.87	24.17	24.75	24.72	24.72
T1_40m	20m	30.51	10.24	10.43	10.45	10.45	1.79	1.46	1.52	1.52	1.52	30.38	23.77	24.23	24.22	24.22
T1_50m	30m	28.10	10.14	10.30	10.32	10.32	1.71	1.43	1.48	1.47	1.47	29.35	23.50	23.88	23.88	23.87
T1_60m	40m	26.31	10.07	10.20	10.22	10.22	1.64	1.41	1.44	1.44	1.44	28.59	23.30	23.63	23.63	23.63
T1_70m	50m	24.93	10.01	10.13	10.15	10.15	1.60	1.39	1.42	1.42	1.42	28.01	23.15	23.43	23.44	23.44
T1_80m	60m	23.83	9.96	10.07	10.09	10.09	1.56	1.37	1.40	1.40	1.40	27.55	23.03	23.28	23.29	23.29
T1_90m	70m	22.93	9.92	10.02	10.04	10.04	1.53	1.36	1.39	1.39	1.39	27.18	22.93	23.16	23.16	23.16
T1_100m	80m	22.18	9.89	9.98	10.00	10.00	1.50	1.35	1.38	1.38	1.38	26.86	22.85	23.06	23.06	23.06
T1_110m	90m	21.54	9.87	9.95	9.96	9.96	1.48	1.34	1.37	1.37	1.37	26.60	22.78	22.97	22.98	22.98
T1_120m	100m	20.99	9.84	9.92	9.93	9.93	1.47	1.34	1.36	1.36	1.36	26.38	22.72	22.90	22.90	22.90
T1_130m	110m	20.51	9.82	9.90	9.91	9.91	1.45	1.33	1.35	1.35	1.35	26.18	22.67	22.84	22.84	22.84
T1_140m	120m	20.09	9.81	9.87	9.88	9.88	1.44	1.32	1.34	1.34	1.34	26.01	22.63	22.78	22.79	22.79
T1_150m	130m	19.72	9.79	9.85	9.86	9.86	1.43	1.32	1.34	1.34	1.34	25.86	22.59	22.73	22.74	22.74
T1_160m	140m	19.39	9.78	9.84	9.85	9.85	1.41	1.32	1.33	1.33	1.33	25.73	22.56	22.69	22.70	22.70
T1_170m	150m	19.09	9.76	9.82	9.83	9.83	1.41	1.31	1.33	1.33	1.33	25.61	22.53	22.65	22.66	22.66
T1_180m	160m	18.82	9.75	9.81	9.82	9.82	1.40	1.31	1.32	1.32	1.32	25.50	22.50	22.62	22.62	22.62
T1_190m	170m	18.58	9.74	9.79	9.80	9.80	1.39	1.31	1.32	1.32	1.32	25.40	22.48	22.59	22.59	22.59
T1_200m	180m	18.36	9.73	9.78	9.79	9.79	1.38	1.30	1.32	1.32	1.32	25.31	22.45	22.56	22.57	22.57
T2_51.5m	190m	27.60	10.12	10.26	10.28	10.28	1.69	1.42	1.46	1.47	1.47	29.14	23.44	23.79	23.80	23.80
T2_60m	200m	26.03	10.05	10.18	10.20	10.20	1.64	1.40	1.44	1.44	1.44	28.49	23.27	23.58	23.59	23.59
T2_70m	1m	24.60	9.99	10.11	10.12	10.12	1.59	1.38	1.42	1.42	1.42	27.90	23.12	23.39	23.40	23.40
T2_80m	10m	23.46	9.94	10.05	10.06	10.06	1.55	1.37	1.40	1.40	1.40	27.43	23.00	23.24	23.25	23.25
T2_90m	20m	22.54	9.91	10.00	10.01	10.01	1.52	1.36	1.38	1.38	1.38	27.05	22.90	23.11	23.12	23.12
T2_100m	30m	21.78	9.87	9.96	9.97	9.97	1.50	1.35	1.37	1.37	1.37	26.73	22.82	23.01	23.02	23.02
T2_110m	40m	21.13	9.85	9.93	9.94	9.94	1.48	1.34	1.36	1.36	1.36	26.47	22.75	22.93	22.94	22.94

Transect	Distance from road	NOx					Ammonia					Nitrogen deposition				
		2019 baseline	2041 Future Base (no growth)	2041 DM (without Local Plan)	2041 DS1 (Local Plan added scenario 1)	2041 DS2 (Local Plan added scenario 2)	2019 baseline	2041 Future Base (no growth)	2041 DM (without Local Plan)	2041 DS1 (Local Plan added scenario 1)	2041 DS2 (Local Plan added scenario 2)	2019 baseline	2041 Future Base (no growth)	2041 DM (without Local Plan)	2041 DS1 (Local Plan added scenario 1)	2041 DS2 (Local Plan added scenario 2)
T2_120m	50m	20.59	9.83	9.90	9.91	9.91	1.46	1.33	1.35	1.35	1.35	26.25	22.69	22.86	22.87	22.87
T2_130m	60m	20.11	9.81	9.87	9.88	9.88	1.44	1.33	1.34	1.35	1.35	26.05	22.65	22.80	22.80	22.80
T2_140m	70m	19.70	9.79	9.85	9.86	9.86	1.43	1.32	1.34	1.34	1.34	25.89	22.60	22.74	22.75	22.75
T2_150m	80m	19.34	9.77	9.83	9.84	9.84	1.42	1.32	1.33	1.33	1.33	25.74	22.57	22.70	22.70	22.70
T2_160m	90m	19.02	9.76	9.82	9.82	9.82	1.41	1.31	1.33	1.33	1.33	25.61	22.53	22.66	22.66	22.66
T2_170m	100m	18.73	9.75	9.80	9.81	9.81	1.40	1.31	1.32	1.32	1.32	25.49	22.50	22.62	22.63	22.63
T2_180m	110m	18.47	9.74	9.79	9.79	9.79	1.39	1.31	1.32	1.32	1.32	25.39	22.48	22.59	22.59	22.59
T2_190m	120m	18.24	9.73	9.78	9.78	9.78	1.38	1.30	1.32	1.32	1.32	25.29	22.45	22.56	22.56	22.56
T2_200m	130m	18.03	9.72	9.76	9.77	9.77	1.38	1.30	1.31	1.31	1.31	25.21	22.43	22.53	22.54	22.54
T7_15.5m	140m	44.84	10.41	10.77	10.79	10.79	2.24	1.58	1.69	1.68	1.68	36.06	24.92	25.86	25.80	25.79
T7_20m	150m	40.73	10.24	10.54	10.56	10.56	2.08	1.52	1.62	1.61	1.61	34.27	24.43	25.22	25.17	25.17
T7_30m	160m	34.70	9.98	10.22	10.24	10.24	1.86	1.43	1.51	1.50	1.50	31.67	23.72	24.31	24.28	24.28
T7_40m	170m	30.93	9.82	10.01	10.03	10.03	1.72	1.38	1.44	1.44	1.44	30.04	23.28	23.75	23.74	23.74
T7_50m	180m	28.31	9.71	9.87	9.89	9.89	1.63	1.35	1.39	1.39	1.39	28.93	22.98	23.37	23.37	23.37
T7_60m	190m	26.39	9.63	9.77	9.79	9.79	1.56	1.32	1.36	1.36	1.36	28.12	22.77	23.10	23.10	23.10
T7_70m	200m	24.91	9.57	9.69	9.71	9.71	1.51	1.30	1.33	1.33	1.33	27.49	22.61	22.89	22.90	22.90
T7_80m	1m	23.73	9.52	9.63	9.64	9.64	1.47	1.28	1.32	1.32	1.32	27.00	22.48	22.73	22.74	22.74
T7_90m	10m	22.77	9.48	9.58	9.59	9.59	1.44	1.27	1.30	1.30	1.30	26.60	22.37	22.60	22.61	22.61
T7_100m	20m	21.98	9.45	9.54	9.55	9.55	1.41	1.26	1.29	1.29	1.29	26.27	22.29	22.50	22.50	22.50
T7_110m	30m	21.30	9.42	9.50	9.51	9.51	1.39	1.25	1.28	1.28	1.28	26.00	22.22	22.41	22.41	22.41
T7_120m	40m	20.73	9.40	9.47	9.48	9.48	1.37	1.25	1.27	1.27	1.27	25.76	22.16	22.33	22.33	22.33
T7_130m	50m	20.22	9.37	9.44	9.46	9.46	1.36	1.24	1.26	1.26	1.26	25.55	22.10	22.26	22.27	22.27
T7_140m	60m	19.79	9.36	9.42	9.43	9.43	1.34	1.23	1.25	1.25	1.25	25.37	22.06	22.21	22.21	22.21
T7_150m	70m	19.40	9.34	9.40	9.41	9.41	1.33	1.23	1.25	1.25	1.25	25.22	22.02	22.15	22.16	22.16
T7_160m	80m	19.05	9.33	9.38	9.39	9.39	1.32	1.23	1.24	1.24	1.24	25.08	21.98	22.11	22.12	22.12
T7_170m	90m	18.75	9.31	9.37	9.38	9.38	1.31	1.22	1.24	1.24	1.24	24.96	21.95	22.07	22.08	22.08
T7_180m	100m	18.47	9.30	9.35	9.36	9.36	1.30	1.22	1.23	1.23	1.23	24.84	21.93	22.04	22.04	22.04
T7_190m	110m	18.22	9.29	9.34	9.35	9.35	1.29	1.22	1.23	1.23	1.23	24.74	21.90	22.00	22.01	22.01
T7_200m	120m	17.99	9.28	9.33	9.33	9.33	1.29	1.21	1.22	1.22	1.22	24.65	21.88	21.97	21.98	21.98
T3_5.75m	130m	22.01	9.26	9.31	9.16	9.16	1.87	1.57	1.59	1.53	1.53	29.97	24.59	24.75	24.28	24.28
T3_10m	140m	19.47	9.11	9.16	9.04	9.04	1.73	1.51	1.53	1.49	1.49	28.51	24.13	24.25	23.91	23.91
T3_20m	150m	16.71	8.96	8.99	8.92	8.92	1.59	1.46	1.46	1.44	1.44	26.96	23.65	23.72	23.51	23.51
T3_30m	160m	15.45	8.89	8.91	8.86	8.86	1.52	1.43	1.44	1.42	1.42	26.26	23.43	23.48	23.34	23.34
T3_40m	170m	14.73	8.85	8.87	8.83	8.83	1.49	1.42	1.42	1.41	1.41	25.87	23.31	23.35	23.24	23.24
T3_50m	180m	14.25	8.82	8.84	8.80	8.80	1.47	1.41	1.41	1.40	1.40	25.61	23.23	23.27	23.18	23.18
T3_60m	190m	13.92	8.81	8.82	8.79	8.79	1.45	1.40	1.40	1.39	1.39	25.44	23.18	23.21	23.13	23.13
T3_70m	200m	13.67	8.79	8.80	8.78	8.78	1.44	1.39	1.40	1.39	1.39	25.31	23.14	23.17	23.10	23.10
T3_80m	1m	13.48	8.78	8.79	8.77	8.77	1.43	1.39	1.39	1.39	1.39	25.21	23.11	23.14	23.08	23.08
T3_90m	10m	13.32	8.77	8.78	8.76	8.76	1.42	1.39	1.39	1.38	1.38	25.13	23.09	23.11	23.06	23.06

Transect	Distance from road	NOx					Ammonia					Nitrogen deposition				
		2019 baseline	2041 Future Base (no growth)	2041 DM (without Local Plan)	2041 DS1 (Local Plan added scenario 1)	2041 DS2 (Local Plan added scenario 2)	2019 baseline	2041 Future Base (no growth)	2041 DM (without Local Plan)	2041 DS1 (Local Plan added scenario 1)	2041 DS2 (Local Plan added scenario 2)	2019 baseline	2041 Future Base (no growth)	2041 DM (without Local Plan)	2041 DS1 (Local Plan added scenario 1)	2041 DS2 (Local Plan added scenario 2)
T3_100m	20m	13.20	8.77	8.77	8.76	8.76	1.42	1.39	1.39	1.38	1.38	25.06	23.07	23.09	23.04	23.04
T3_110m	30m	13.09	8.76	8.77	8.75	8.75	1.41	1.38	1.39	1.38	1.38	25.01	23.05	23.07	23.03	23.03
T3_120m	40m	13.01	8.75	8.76	8.75	8.75	1.41	1.38	1.38	1.38	1.38	24.97	23.04	23.06	23.02	23.02
T3_130m	50m	12.93	8.75	8.76	8.74	8.74	1.40	1.38	1.38	1.38	1.38	24.93	23.03	23.05	23.01	23.01
T3_140m	60m	12.87	8.75	8.75	8.74	8.74	1.40	1.38	1.38	1.38	1.38	24.90	23.02	23.03	23.00	23.00
T3_150m	70m	12.81	8.74	8.75	8.74	8.74	1.40	1.38	1.38	1.38	1.38	24.87	23.01	23.02	23.00	23.00
T3_160m	80m	12.76	8.74	8.75	8.74	8.74	1.40	1.38	1.38	1.38	1.38	24.84	23.01	23.02	22.99	22.99
T3_170m	90m	12.72	8.74	8.74	8.73	8.73	1.40	1.38	1.38	1.38	1.38	24.82	23.00	23.01	22.98	22.98
T3_180m	100m	12.68	8.74	8.74	8.73	8.73	1.39	1.38	1.38	1.38	1.38	24.80	22.99	23.01	22.98	22.98
T3_190m	110m	12.64	8.73	8.74	8.73	8.73	1.39	1.38	1.38	1.37	1.37	24.79	22.99	23.00	22.98	22.98
T3_200m	120m	12.61	8.73	8.74	8.73	8.73	1.39	1.38	1.38	1.37	1.37	24.77	22.98	23.00	22.97	22.97
T4_5.25m	130m	21.66	8.71	8.76	8.66	8.66	2.00	1.69	1.71	1.67	1.67	30.59	24.98	25.13	24.84	24.83
T4_10m	140m	21.66	8.71	8.76	8.66	8.66	2.00	1.69	1.71	1.67	1.67	30.59	24.98	25.13	24.84	24.83
T4_20m	150m	16.94	8.45	8.48	8.42	8.42	1.75	1.59	1.60	1.58	1.58	27.92	24.16	24.24	24.08	24.08
T4_30m	160m	15.13	8.35	8.37	8.33	8.33	1.66	1.55	1.56	1.54	1.54	26.92	23.85	23.91	23.80	23.80
T4_40m	170m	14.17	8.29	8.31	8.28	8.28	1.62	1.53	1.54	1.53	1.53	26.40	23.69	23.74	23.65	23.65
T4_50m	180m	13.57	8.26	8.27	8.25	8.25	1.59	1.52	1.52	1.52	1.52	26.08	23.60	23.63	23.57	23.57
T4_60m	190m	13.16	8.24	8.25	8.23	8.23	1.57	1.51	1.51	1.51	1.51	25.86	23.53	23.56	23.51	23.50
T4_70m	200m	12.86	8.22	8.23	8.21	8.21	1.55	1.51	1.51	1.50	1.50	25.71	23.49	23.51	23.47	23.46
T4_80m	1m	12.63	8.21	8.22	8.20	8.20	1.54	1.50	1.50	1.50	1.50	25.59	23.45	23.47	23.43	23.43
T4_90m	10m	12.45	8.20	8.21	8.19	8.19	1.54	1.50	1.50	1.50	1.50	25.50	23.42	23.44	23.41	23.41
T4_100m	20m	12.31	8.19	8.20	8.18	8.18	1.53	1.50	1.50	1.49	1.49	25.42	23.40	23.42	23.39	23.39
T4_110m	30m	12.19	8.18	8.19	8.18	8.18	1.52	1.49	1.50	1.49	1.49	25.36	23.38	23.40	23.37	23.37
T4_120m	40m	12.09	8.18	8.18	8.17	8.17	1.52	1.49	1.49	1.49	1.49	25.31	23.37	23.38	23.36	23.36
T4_130m	50m	12.00	8.17	8.18	8.17	8.17	1.52	1.49	1.49	1.49	1.49	25.27	23.36	23.37	23.35	23.34
T4_140m	60m	11.93	8.17	8.17	8.17	8.16	1.51	1.49	1.49	1.49	1.49	25.23	23.34	23.36	23.34	23.34
T4_150m	70m	11.86	8.17	8.17	8.16	8.16	1.51	1.49	1.49	1.49	1.49	25.20	23.34	23.35	23.33	23.33
T4_160m	80m	11.81	8.16	8.17	8.16	8.16	1.51	1.49	1.49	1.49	1.49	25.17	23.33	23.34	23.32	23.32
T4_170m	90m	11.76	8.16	8.16	8.16	8.16	1.50	1.49	1.49	1.49	1.49	25.15	23.32	23.33	23.31	23.31
T4_180m	100m	11.71	8.16	8.16	8.15	8.15	1.50	1.49	1.49	1.48	1.48	25.13	23.32	23.33	23.31	23.31
T4_190m	110m	11.67	8.15	8.16	8.15	8.15	1.50	1.48	1.49	1.48	1.48	25.11	23.31	23.32	23.30	23.30
T4_200m	120m	11.64	8.15	8.16	8.15	8.15	1.50	1.48	1.48	1.48	1.48	25.09	23.30	23.31	23.30	23.30
T5_3.75m	130m	23.14	8.64	8.70	8.58	8.58	2.11	1.74	1.76	1.72	1.72	31.62	25.32	25.49	25.14	25.14
T5_10m	140m	23.14	8.64	8.70	8.58	8.58	2.11	1.74	1.76	1.72	1.72	31.62	25.32	25.49	25.14	25.14
T5_20m	150m	17.36	8.32	8.35	8.29	8.28	1.80	1.62	1.63	1.61	1.61	28.33	24.29	24.39	24.20	24.20
T5_30m	160m	15.27	8.20	8.22	8.18	8.18	1.70	1.57	1.58	1.57	1.57	27.17	23.94	24.00	23.88	23.88
T5_40m	170m	14.18	8.14	8.16	8.12	8.12	1.64	1.55	1.56	1.55	1.55	26.57	23.76	23.80	23.71	23.71
T5_50m	180m	13.51	8.10	8.12	8.09	8.09	1.61	1.54	1.54	1.53	1.53	26.21	23.65	23.69	23.61	23.61
T5_60m	190m	13.05	8.08	8.09	8.07	8.07	1.59	1.53	1.53	1.53	1.53	25.97	23.58	23.61	23.55	23.55

Transect	Distance from road	NOx					Ammonia					Nitrogen deposition				
		2019 baseline	2041 Future Base (no growth)	2041 DM (without Local Plan)	2041 DS1 (Local Plan added scenario 1)	2041 DS2 (Local Plan added scenario 2)	2019 baseline	2041 Future Base (no growth)	2041 DM (without Local Plan)	2041 DS1 (Local Plan added scenario 1)	2041 DS2 (Local Plan added scenario 2)	2019 baseline	2041 Future Base (no growth)	2041 DM (without Local Plan)	2041 DS1 (Local Plan added scenario 1)	2041 DS2 (Local Plan added scenario 2)
T5_70m	200m	12.72	8.06	8.07	8.05	8.05	1.57	1.52	1.53	1.52	1.52	25.80	23.52	23.55	23.50	23.50
T5_80m	1m	12.47	8.04	8.05	8.04	8.04	1.56	1.52	1.52	1.52	1.52	25.66	23.48	23.51	23.46	23.46
T5_90m	10m	12.27	8.03	8.04	8.03	8.03	1.55	1.51	1.52	1.51	1.51	25.56	23.45	23.48	23.44	23.44
T5_100m	20m	12.12	8.02	8.03	8.02	8.02	1.55	1.51	1.51	1.51	1.51	25.48	23.43	23.45	23.41	23.41
T5_110m	30m	11.98	8.02	8.02	8.01	8.01	1.54	1.51	1.51	1.51	1.51	25.42	23.41	23.43	23.40	23.40
T5_120m	40m	11.87	8.01	8.02	8.01	8.01	1.54	1.51	1.51	1.51	1.51	25.36	23.39	23.41	23.38	23.38
T5_130m	50m	11.78	8.01	8.01	8.00	8.00	1.53	1.51	1.51	1.50	1.50	25.31	23.38	23.39	23.37	23.37
T5_140m	60m	11.70	8.00	8.01	8.00	8.00	1.53	1.50	1.51	1.50	1.50	25.27	23.37	23.38	23.36	23.36
T5_150m	70m	11.63	8.00	8.00	7.99	7.99	1.53	1.50	1.50	1.50	1.50	25.24	23.36	23.37	23.35	23.35
T5_160m	80m	11.57	7.99	8.00	7.99	7.99	1.52	1.50	1.50	1.50	1.50	25.21	23.35	23.36	23.34	23.34
T5_170m	90m	11.51	7.99	8.00	7.99	7.99	1.52	1.50	1.50	1.50	1.50	25.18	23.34	23.35	23.33	23.33
T5_180m	100m	11.47	7.99	7.99	7.99	7.99	1.52	1.50	1.50	1.50	1.50	25.16	23.33	23.34	23.33	23.32
T5_190m	110m	11.42	7.99	7.99	7.98	7.98	1.52	1.50	1.50	1.50	1.50	25.14	23.33	23.34	23.32	23.32
T5_200m	120m	11.38	7.98	7.99	7.98	7.98	1.52	1.50	1.50	1.50	1.50	25.12	23.32	23.33	23.31	23.31
T6_173.5m	130m	10.13	7.20	7.20	7.20	7.20	1.50	1.49	1.49	1.49	1.49	25.63	23.91	23.92	23.90	23.90
T6_180m	140m	10.10	7.20	7.20	7.20	7.20	1.50	1.49	1.49	1.49	1.49	25.62	23.91	23.91	23.90	23.90
T6_190m	150m	10.07	7.20	7.20	7.20	7.20	1.50	1.49	1.49	1.49	1.49	25.61	23.90	23.91	23.90	23.90
T6_200m	160m	10.04	7.20	7.20	7.19	7.19	1.50	1.49	1.49	1.49	1.49	25.59	23.90	23.90	23.89	23.89
T8_44.5m	170m	13.58	7.75	7.76	7.73	7.73	1.66	1.56	1.57	1.56	1.56	27.13	24.33	24.38	24.29	24.28
T8_50m	180m	13.24	7.73	7.74	7.71	7.71	1.64	1.56	1.56	1.55	1.55	26.96	24.28	24.32	24.24	24.23
T8_60m	190m	12.76	7.70	7.71	7.69	7.69	1.62	1.55	1.55	1.54	1.54	26.70	24.20	24.23	24.17	24.17
T8_70m	200m	12.40	7.68	7.69	7.67	7.67	1.60	1.54	1.54	1.54	1.54	26.51	24.14	24.17	24.11	24.11
T8_80m	1m	12.12	7.67	7.68	7.66	7.66	1.59	1.53	1.54	1.53	1.53	26.36	24.10	24.12	24.07	24.07
T8_90m	10m	11.90	7.65	7.66	7.64	7.64	1.58	1.53	1.53	1.53	1.53	26.25	24.07	24.09	24.04	24.04
T8_100m	20m	11.72	7.64	7.65	7.64	7.64	1.57	1.53	1.53	1.52	1.52	26.16	24.04	24.06	24.02	24.02
T8_110m	30m	11.57	7.64	7.64	7.63	7.63	1.56	1.52	1.53	1.52	1.52	26.08	24.01	24.03	24.00	23.99
T8_120m	40m	11.45	7.63	7.64	7.62	7.62	1.56	1.52	1.52	1.52	1.52	26.01	23.99	24.01	23.98	23.98
T8_130m	50m	11.34	7.62	7.63	7.62	7.62	1.55	1.52	1.52	1.52	1.52	25.96	23.98	23.99	23.96	23.96
T8_140m	60m	11.25	7.62	7.62	7.61	7.61	1.55	1.52	1.52	1.52	1.52	25.91	23.97	23.98	23.95	23.95
T8_150m	70m	11.16	7.61	7.62	7.61	7.61	1.54	1.52	1.52	1.51	1.51	25.87	23.95	23.97	23.94	23.94
T9_49m	80m	12.44	7.68	7.71	7.71	7.71	1.66	1.61	1.62	1.62	1.62	16.72	14.73	14.78	14.78	14.78
T9_50m	90m	12.40	7.68	7.71	7.71	7.71	1.66	1.61	1.62	1.62	1.62	16.71	14.72	14.77	14.78	14.78
T9_60m	100m	12.09	7.66	7.69	7.69	7.69	1.65	1.60	1.61	1.61	1.61	16.61	14.69	14.73	14.74	14.74
T9_70m	110m	11.85	7.65	7.67	7.67	7.67	1.64	1.60	1.60	1.60	1.60	16.53	14.67	14.71	14.71	14.71
T9_80m	120m	11.67	7.64	7.66	7.66	7.66	1.63	1.59	1.60	1.60	1.60	16.47	14.65	14.68	14.68	14.68
T9_90m	130m	11.53	7.63	7.65	7.65	7.65	1.62	1.59	1.60	1.60	1.60	16.43	14.64	14.67	14.67	14.67
T9_100m	140m	11.41	7.63	7.64	7.64	7.64	1.62	1.59	1.59	1.59	1.59	16.39	14.63	14.65	14.65	14.65
T9_110m	150m	11.31	7.62	7.64	7.64	7.64	1.61	1.59	1.59	1.59	1.59	16.36	14.62	14.64	14.64	14.64
T9_120m	160m	11.23	7.62	7.63	7.63	7.63	1.61	1.59	1.59	1.59	1.59	16.34	14.61	14.63	14.63	14.63

Transect	Distance from road	NOx					Ammonia					Nitrogen deposition				
		2019 baseline	2041 Future Base (no growth)	2041 DM (without Local Plan)	2041 DS1 (Local Plan added scenario 1)	2041 DS2 (Local Plan added scenario 2)	2019 baseline	2041 Future Base (no growth)	2041 DM (without Local Plan)	2041 DS1 (Local Plan added scenario 1)	2041 DS2 (Local Plan added scenario 2)	2019 baseline	2041 Future Base (no growth)	2041 DM (without Local Plan)	2041 DS1 (Local Plan added scenario 1)	2041 DS2 (Local Plan added scenario 2)
T9_130m	170m	11.16	7.61	7.63	7.63	7.63	1.61	1.59	1.59	1.59	1.59	16.32	14.60	14.62	14.62	14.62
T9_140m	180m	11.10	7.61	7.62	7.62	7.62	1.60	1.58	1.59	1.59	1.59	16.30	14.60	14.62	14.62	14.62
T9_150m	190m	11.05	7.61	7.62	7.62	7.62	1.60	1.58	1.59	1.59	1.59	16.28	14.59	14.61	14.61	14.61
T9_160m	200m	11.00	7.61	7.62	7.62	7.62	1.60	1.58	1.59	1.59	1.59	16.27	14.59	14.60	14.60	14.60
T9_170m	1m	10.96	7.60	7.61	7.61	7.61	1.60	1.58	1.58	1.59	1.59	16.26	14.58	14.60	14.60	14.60
T9_180m	10m	10.92	7.60	7.61	7.61	7.61	1.60	1.58	1.58	1.58	1.58	16.24	14.58	14.59	14.59	14.59
T9_190m	20m	10.89	7.60	7.61	7.61	7.61	1.59	1.58	1.58	1.58	1.58	16.23	14.58	14.59	14.59	14.59
T9_200m	30m	10.86	7.60	7.61	7.61	7.61	1.59	1.58	1.58	1.58	1.58	16.23	14.58	14.59	14.59	14.59
T10_5.25m	40m	40.01	8.88	9.01	9.03	9.03	2.81	2.03	2.08	2.08	2.08	24.39	16.74	16.99	17.03	17.03
T10_10m	50m	32.79	8.56	8.67	8.68	8.68	2.48	1.91	1.94	1.95	1.95	22.18	16.06	16.25	16.29	16.28
T10_20m	60m	25.34	8.23	8.30	8.31	8.31	2.15	1.78	1.80	1.81	1.81	19.93	15.38	15.51	15.53	15.53
T10_30m	70m	21.66	8.07	8.12	8.13	8.13	1.99	1.72	1.74	1.74	1.74	18.83	15.05	15.15	15.16	15.16
T10_40m	80m	19.43	7.97	8.02	8.02	8.02	1.90	1.68	1.70	1.70	1.70	18.18	14.86	14.93	14.95	14.95
T10_50m	90m	17.94	7.90	7.94	7.95	7.95	1.83	1.66	1.67	1.67	1.67	17.74	14.73	14.79	14.80	14.80
T10_60m	100m	16.86	7.86	7.89	7.89	7.89	1.79	1.64	1.65	1.65	1.65	17.44	14.64	14.69	14.70	14.70
T10_70m	110m	16.05	7.82	7.85	7.85	7.85	1.76	1.63	1.64	1.64	1.64	17.20	14.57	14.62	14.63	14.63
T10_80m	120m	15.41	7.79	7.82	7.82	7.82	1.73	1.62	1.63	1.63	1.63	17.02	14.52	14.56	14.57	14.57
T10_90m	130m	14.90	7.77	7.79	7.80	7.80	1.71	1.61	1.62	1.62	1.62	16.88	14.48	14.51	14.52	14.52
T10_100m	140m	14.48	7.75	7.77	7.78	7.78	1.70	1.60	1.61	1.61	1.61	16.76	14.44	14.47	14.48	14.48
T10_110m	150m	14.14	7.74	7.76	7.76	7.76	1.68	1.60	1.61	1.61	1.61	16.66	14.41	14.44	14.45	14.45
T10_120m	160m	13.84	7.72	7.74	7.74	7.74	1.67	1.60	1.60	1.60	1.60	16.58	14.39	14.42	14.42	14.42
T10_130m	170m	13.58	7.71	7.73	7.73	7.73	1.66	1.59	1.60	1.60	1.60	16.51	14.37	14.39	14.40	14.40
T10_140m	180m	13.36	7.70	7.72	7.72	7.72	1.65	1.59	1.59	1.59	1.59	16.45	14.35	14.37	14.38	14.38
T10_150m	190m	13.17	7.69	7.71	7.71	7.71	1.65	1.59	1.59	1.59	1.59	16.40	14.34	14.36	14.36	14.36
T10_160m	200m	13.00	7.69	7.70	7.70	7.70	1.64	1.58	1.59	1.59	1.59	16.35	14.32	14.34	14.35	14.35
T10_170m	1m	12.85	7.68	7.69	7.69	7.69	1.63	1.58	1.58	1.58	1.58	16.31	14.31	14.33	14.33	14.33
T10_180m	10m	12.71	7.67	7.69	7.69	7.69	1.63	1.58	1.58	1.58	1.58	16.27	14.30	14.32	14.32	14.32
T10_190m	20m	12.59	7.67	7.68	7.68	7.68	1.62	1.58	1.58	1.58	1.58	16.24	14.29	14.31	14.31	14.31
T10_200m	30m	12.48	7.66	7.67	7.68	7.68	1.62	1.58	1.58	1.58	1.58	16.21	14.28	14.30	14.30	14.30
T11_0.25m	40m	30.01	8.44	8.54	8.55	8.55	2.35	1.86	1.89	1.90	1.90	21.33	15.81	15.99	16.02	16.02
T11_10m	50m	23.68	8.16	8.23	8.23	8.23	2.07	1.75	1.77	1.78	1.78	19.42	15.23	15.35	15.37	15.36
T11_20m	60m	20.45	8.02	8.07	8.07	8.07	1.94	1.70	1.71	1.72	1.72	18.46	14.94	15.03	15.04	15.04
T11_30m	70m	18.51	7.93	7.97	7.98	7.98	1.85	1.67	1.68	1.68	1.68	17.89	14.77	14.84	14.85	14.85
T11_40m	80m	17.20	7.87	7.91	7.91	7.91	1.80	1.64	1.66	1.66	1.66	17.51	14.66	14.72	14.73	14.73
T11_50m	90m	16.26	7.83	7.86	7.86	7.86	1.76	1.63	1.64	1.64	1.64	17.24	14.58	14.63	14.64	14.64
T11_60m	100m	15.55	7.80	7.83	7.83	7.83	1.73	1.62	1.63	1.63	1.63	17.04	14.52	14.56	14.57	14.57
T11_70m	110m	14.99	7.77	7.80	7.80	7.80	1.71	1.61	1.62	1.62	1.62	16.88	14.47	14.51	14.52	14.52
T11_80m	120m	14.53	7.75	7.78	7.78	7.78	1.69	1.60	1.61	1.61	1.61	16.76	14.44	14.47	14.48	14.48
T11_90m	130m	14.16	7.74	7.76	7.76	7.76	1.68	1.60	1.60	1.61	1.61	16.65	14.41	14.44	14.44	14.44

Transect	Distance from road	NOx					Ammonia					Nitrogen deposition				
		2019 baseline	2041 Future Base (no growth)	2041 DM (without Local Plan)	2041 DS1 (Local Plan added scenario 1)	2041 DS2 (Local Plan added scenario 2)	2019 baseline	2041 Future Base (no growth)	2041 DM (without Local Plan)	2041 DS1 (Local Plan added scenario 1)	2041 DS2 (Local Plan added scenario 2)	2019 baseline	2041 Future Base (no growth)	2041 DM (without Local Plan)	2041 DS1 (Local Plan added scenario 1)	2041 DS2 (Local Plan added scenario 2)
T11_100m	140m	13.85	7.72	7.74	7.74	7.74	1.67	1.59	1.60	1.60	1.60	16.56	14.38	14.41	14.42	14.42
T11_110m	150m	13.58	7.71	7.73	7.73	7.73	1.66	1.59	1.59	1.60	1.60	16.49	14.36	14.39	14.39	14.39
T11_120m	160m	13.35	7.70	7.72	7.72	7.72	1.65	1.59	1.59	1.59	1.59	16.43	14.34	14.37	14.37	14.37
T11_130m	170m	13.15	7.69	7.71	7.71	7.71	1.64	1.58	1.59	1.59	1.59	16.37	14.33	14.35	14.35	14.35
T11_140m	180m	12.97	7.68	7.70	7.70	7.70	1.63	1.58	1.58	1.59	1.59	16.33	14.31	14.33	14.34	14.34
T11_150m	190m	12.81	7.68	7.69	7.69	7.69	1.63	1.58	1.58	1.58	1.58	16.28	14.30	14.32	14.32	14.32
T11_160m	200m	12.67	7.67	7.68	7.69	7.69	1.62	1.58	1.58	1.58	1.58	16.25	14.29	14.31	14.31	14.31
T11_170m	1m	12.54	7.67	7.68	7.68	7.68	1.62	1.58	1.58	1.58	1.58	16.21	14.28	14.30	14.30	14.30
T11_180m	10m	12.43	7.66	7.67	7.67	7.67	1.62	1.57	1.58	1.58	1.58	16.18	14.27	14.29	14.29	14.29
T11_190m	20m	12.33	7.66	7.67	7.67	7.67	1.61	1.57	1.58	1.58	1.58	16.15	14.27	14.28	14.28	14.28
T11_200m	30m	12.23	7.65	7.66	7.66	7.66	1.61	1.57	1.57	1.57	1.57	16.13	14.26	14.27	14.27	14.27
T12_0.35m	40m	14.42	7.83	8.11	8.15	8.16	1.61	1.50	1.60	1.61	1.61	28.06	24.96	25.81	25.93	25.94
T12_10m	50m	11.94	7.72	7.84	7.85	7.86	1.50	1.45	1.49	1.50	1.50	26.75	24.60	24.93	24.97	24.98
T12_20m	60m	11.32	7.70	7.77	7.78	7.78	1.47	1.44	1.47	1.47	1.47	26.43	24.52	24.71	24.74	24.74
T12_30m	70m	11.03	7.68	7.73	7.74	7.74	1.46	1.44	1.45	1.46	1.46	26.28	24.48	24.62	24.63	24.64
T12_40m	80m	10.87	7.68	7.72	7.72	7.72	1.45	1.43	1.45	1.45	1.45	26.20	24.46	24.56	24.58	24.58
T12_50m	90m	10.77	7.67	7.70	7.71	7.71	1.44	1.43	1.44	1.44	1.44	26.15	24.44	24.53	24.54	24.54
T12_60m	100m	10.70	7.67	7.70	7.70	7.70	1.44	1.43	1.44	1.44	1.44	26.12	24.43	24.50	24.51	24.52
T12_70m	110m	10.64	7.67	7.69	7.69	7.69	1.44	1.43	1.44	1.44	1.44	26.09	24.43	24.49	24.49	24.49
T12_80m	120m	10.60	7.67	7.69	7.69	7.69	1.44	1.43	1.44	1.44	1.44	26.07	24.42	24.47	24.48	24.48
T12_90m	130m	10.57	7.66	7.68	7.69	7.69	1.44	1.43	1.44	1.44	1.44	26.06	24.42	24.46	24.47	24.47
T12_100m	140m	10.54	7.66	7.68	7.68	7.68	1.44	1.43	1.43	1.43	1.44	26.04	24.41	24.46	24.46	24.46
T12_110m	150m	10.52	7.66	7.68	7.68	7.68	1.43	1.43	1.43	1.43	1.43	26.03	24.41	24.45	24.45	24.45
T12_120m	160m	10.50	7.66	7.67	7.68	7.68	1.43	1.43	1.43	1.43	1.43	26.02	24.41	24.44	24.45	24.45
T12_130m	170m	10.48	7.66	7.67	7.67	7.67	1.43	1.43	1.43	1.43	1.43	26.02	24.41	24.44	24.44	24.44
T12_140m	180m	10.47	7.66	7.67	7.67	7.67	1.43	1.43	1.43	1.43	1.43	26.01	24.41	24.43	24.44	24.44
T12_150m	190m	10.46	7.66	7.67	7.67	7.67	1.43	1.43	1.43	1.43	1.43	26.01	24.41	24.43	24.43	24.43
T12_160m	200m	10.45	7.66	7.67	7.67	7.67	1.43	1.43	1.43	1.43	1.43	26.00	24.40	24.43	24.43	24.43
T12_170m	1m	10.44	7.66	7.67	7.67	7.67	1.43	1.43	1.43	1.43	1.43	26.00	24.40	24.42	24.43	24.43
T12_180m	10m	10.43	7.66	7.67	7.67	7.67	1.43	1.43	1.43	1.43	1.43	25.99	24.40	24.42	24.42	24.42
T12_190m	20m	10.42	7.66	7.67	7.67	7.67	1.43	1.43	1.43	1.43	1.43	25.99	24.40	24.42	24.42	24.42
T12_200m	30m	10.42	7.66	7.66	7.67	7.67	1.43	1.43	1.43	1.43	1.43	25.99	24.40	24.42	24.42	24.42
T13_85.95m	40m	14.67	10.46	10.47	10.48	10.47	1.30	1.29	1.30	1.30	1.30	25.77	24.17	24.22	24.22	24.21
T13_90m	50m	14.67	10.46	10.47	10.47	10.47	1.30	1.29	1.30	1.30	1.30	25.77	24.17	24.21	24.22	24.21
T13_100m	60m	14.66	10.46	10.47	10.47	10.47	1.30	1.29	1.30	1.30	1.30	25.76	24.17	24.21	24.21	24.21
T13_110m	70m	14.65	10.46	10.47	10.47	10.47	1.30	1.29	1.30	1.30	1.30	25.76	24.17	24.21	24.21	24.20
T13_120m	80m	14.64	10.46	10.47	10.47	10.47	1.30	1.29	1.30	1.30	1.30	25.75	24.17	24.20	24.20	24.20
T13_130m	90m	14.63	10.46	10.47	10.47	10.47	1.30	1.29	1.30	1.30	1.30	25.75	24.17	24.20	24.20	24.20
T13_140m	100m	14.63	10.46	10.47	10.47	10.47	1.30	1.29	1.30	1.30	1.30	25.75	24.17	24.20	24.20	24.19

Transect	Distance from road	NOx					Ammonia					Nitrogen deposition				
		2019 baseline	2041 Future Base (no growth)	2041 DM (without Local Plan)	2041 DS1 (Local Plan added scenario 1)	2041 DS2 (Local Plan added scenario 2)	2019 baseline	2041 Future Base (no growth)	2041 DM (without Local Plan)	2041 DS1 (Local Plan added scenario 1)	2041 DS2 (Local Plan added scenario 2)	2019 baseline	2041 Future Base (no growth)	2041 DM (without Local Plan)	2041 DS1 (Local Plan added scenario 1)	2041 DS2 (Local Plan added scenario 2)
T13_150m	110m	14.62	10.46	10.47	10.47	10.46	1.30	1.29	1.30	1.30	1.30	25.75	24.17	24.19	24.19	24.19
T13_160m	120m	14.62	10.46	10.46	10.47	10.46	1.30	1.29	1.30	1.30	1.30	25.74	24.17	24.19	24.19	24.19
T13_170m	130m	14.61	10.46	10.46	10.46	10.46	1.29	1.29	1.30	1.30	1.30	25.74	24.17	24.19	24.19	24.19
T13_180m	140m	14.61	10.45	10.46	10.46	10.46	1.29	1.29	1.30	1.30	1.29	25.74	24.17	24.19	24.19	24.19
T13_190m	150m	14.60	10.45	10.46	10.46	10.46	1.29	1.29	1.30	1.30	1.29	25.74	24.17	24.19	24.19	24.18
T13_200m	160m	14.60	10.45	10.46	10.46	10.46	1.29	1.29	1.29	1.29	1.29	25.74	24.17	24.19	24.19	24.18
T14_3.55m	170m	39.25	16.94	17.22	17.23	17.22	1.99	1.59	1.66	1.66	1.66	18.28	13.55	13.94	13.94	13.94
T14_10m	180m	35.05	16.74	16.94	16.94	16.93	1.81	1.52	1.58	1.57	1.57	17.07	13.19	13.48	13.47	13.47
T14_20m	190m	31.97	16.59	16.74	16.73	16.73	1.68	1.47	1.51	1.51	1.51	16.18	12.93	13.15	13.13	13.13
T14_30m	200m	30.24	16.51	16.63	16.62	16.61	1.61	1.45	1.48	1.48	1.48	15.69	12.78	12.96	12.94	12.94
T14_40m	1m	29.07	16.45	16.55	16.54	16.54	1.57	1.43	1.46	1.45	1.45	15.36	12.68	12.83	12.82	12.81
T14_50m	10m	28.23	16.41	16.49	16.49	16.48	1.53	1.42	1.44	1.44	1.44	15.12	12.61	12.74	12.72	12.72
T14_60m	20m	27.58	16.38	16.45	16.44	16.44	1.51	1.41	1.43	1.42	1.42	14.93	12.56	12.67	12.66	12.66
T14_70m	30m	27.07	16.35	16.42	16.41	16.41	1.49	1.40	1.42	1.41	1.41	14.79	12.52	12.61	12.60	12.60
T14_80m	40m	26.66	16.33	16.39	16.38	16.38	1.47	1.39	1.41	1.41	1.41	14.68	12.48	12.57	12.56	12.56
T14_90m	50m	26.31	16.31	16.37	16.36	16.36	1.46	1.39	1.40	1.40	1.40	14.58	12.45	12.53	12.52	12.52
T14_100m	60m	26.03	16.30	16.35	16.34	16.34	1.44	1.38	1.39	1.39	1.39	14.50	12.43	12.50	12.49	12.49
T14_110m	70m	25.78	16.29	16.33	16.33	16.33	1.44	1.38	1.39	1.39	1.39	14.43	12.41	12.47	12.47	12.47
T14_120m	80m	25.57	16.28	16.32	16.31	16.31	1.43	1.38	1.39	1.39	1.38	14.38	12.39	12.45	12.44	12.44
T14_130m	90m	25.39	16.27	16.31	16.30	16.30	1.42	1.37	1.38	1.38	1.38	14.33	12.38	12.43	12.43	12.43
T14_140m	100m	25.23	16.26	16.29	16.29	16.29	1.41	1.37	1.38	1.38	1.38	14.28	12.37	12.41	12.41	12.41
T14_150m	110m	25.09	16.25	16.29	16.28	16.28	1.41	1.37	1.38	1.38	1.38	14.24	12.36	12.40	12.40	12.40
T14_160m	120m	24.96	16.25	16.28	16.27	16.27	1.40	1.37	1.37	1.37	1.37	14.21	12.35	12.39	12.38	12.38
T14_170m	130m	24.85	16.24	16.27	16.27	16.27	1.40	1.37	1.37	1.37	1.37	14.18	12.34	12.38	12.37	12.37
T14_180m	140m	24.75	16.24	16.26	16.26	16.26	1.40	1.36	1.37	1.37	1.37	14.15	12.33	12.37	12.36	12.36
T14_190m	150m	24.66	16.23	16.26	16.25	16.25	1.39	1.36	1.37	1.37	1.37	14.13	12.32	12.36	12.35	12.35
T14_200m	160m	24.58	16.23	16.25	16.25	16.25	1.39	1.36	1.37	1.37	1.37	14.11	12.32	12.35	12.34	12.34
T15_2.85m	170m	53.79	17.69	18.17	18.02	18.02	2.83	1.93	2.11	2.07	2.07	23.66	15.37	16.34	16.12	16.13
T15_10m	180m	42.51	17.12	17.43	17.34	17.34	2.24	1.69	1.80	1.78	1.78	19.82	14.12	14.71	14.58	14.58
T15_20m	190m	36.22	16.81	17.02	16.96	16.96	1.92	1.57	1.64	1.63	1.63	17.73	13.45	13.83	13.75	13.75
T15_30m	200m	33.10	16.65	16.81	16.77	16.77	1.77	1.51	1.56	1.55	1.55	16.72	13.12	13.41	13.36	13.36
T15_40m	1m	31.20	16.56	16.69	16.66	16.66	1.68	1.48	1.52	1.51	1.51	16.11	12.93	13.16	13.12	13.12
T15_50m	10m	29.92	16.49	16.60	16.58	16.58	1.62	1.45	1.49	1.48	1.48	15.71	12.81	13.00	12.96	12.96
T15_60m	20m	29.00	16.45	16.54	16.52	16.52	1.58	1.44	1.47	1.46	1.46	15.43	12.72	12.88	12.85	12.85
T15_70m	30m	28.30	16.41	16.50	16.48	16.48	1.55	1.42	1.45	1.44	1.44	15.21	12.65	12.79	12.77	12.77
T15_80m	40m	27.75	16.39	16.46	16.45	16.45	1.52	1.41	1.44	1.43	1.43	15.04	12.60	12.72	12.70	12.70
T15_90m	50m	27.31	16.36	16.43	16.42	16.42	1.51	1.41	1.43	1.42	1.42	14.91	12.56	12.67	12.65	12.65
T15_100m	60m	26.95	16.35	16.41	16.40	16.40	1.49	1.40	1.42	1.42	1.42	14.80	12.53	12.63	12.61	12.61
T15_110m	70m	26.65	16.33	16.39	16.38	16.38	1.48	1.40	1.41	1.41	1.41	14.71	12.50	12.59	12.58	12.58

Transect	Distance from road	NOx					Ammonia					Nitrogen deposition				
		2019 baseline	2041 Future Base (no growth)	2041 DM (without Local Plan)	2041 DS1 (Local Plan added scenario 1)	2041 DS2 (Local Plan added scenario 2)	2019 baseline	2041 Future Base (no growth)	2041 DM (without Local Plan)	2041 DS1 (Local Plan added scenario 1)	2041 DS2 (Local Plan added scenario 2)	2019 baseline	2041 Future Base (no growth)	2041 DM (without Local Plan)	2041 DS1 (Local Plan added scenario 1)	2041 DS2 (Local Plan added scenario 2)
T15_120m	80m	26.39	16.32	16.37	16.36	16.36	1.47	1.39	1.41	1.40	1.40	14.64	12.48	12.56	12.55	12.55
T15_130m	90m	26.17	16.31	16.36	16.35	16.35	1.46	1.39	1.40	1.40	1.40	14.57	12.46	12.53	12.52	12.52
T15_140m	100m	25.98	16.30	16.34	16.34	16.34	1.45	1.38	1.40	1.40	1.40	14.52	12.44	12.51	12.50	12.50
T15_150m	110m	25.81	16.29	16.33	16.33	16.33	1.44	1.38	1.39	1.39	1.39	14.47	12.43	12.49	12.48	12.48
T15_160m	120m	25.66	16.28	16.32	16.32	16.32	1.44	1.38	1.39	1.39	1.39	14.43	12.41	12.48	12.47	12.47
T15_170m	130m	25.53	16.28	16.32	16.31	16.31	1.43	1.38	1.39	1.39	1.39	14.39	12.40	12.46	12.45	12.45
T15_180m	140m	25.41	16.27	16.31	16.30	16.30	1.43	1.38	1.39	1.38	1.38	14.35	12.39	12.45	12.44	12.44
T15_190m	150m	25.30	16.27	16.30	16.29	16.29	1.42	1.37	1.38	1.38	1.38	14.32	12.38	12.43	12.43	12.43
T15_200m	160m	25.20	16.26	16.29	16.29	16.29	1.42	1.37	1.38	1.38	1.38	14.29	12.37	12.42	12.42	12.42
T16_20.5m	170m	21.27	13.68	13.75	13.77	13.77	1.44	1.39	1.41	1.42	1.42	14.60	12.59	12.73	12.75	12.76
T16_30m	180m	21.03	13.67	13.72	13.73	13.74	1.43	1.39	1.40	1.41	1.41	14.54	12.57	12.67	12.69	12.70
T16_40m	190m	20.85	13.66	13.71	13.71	13.72	1.43	1.38	1.40	1.40	1.40	14.49	12.56	12.64	12.65	12.65
T16_50m	200m	20.70	13.65	13.69	13.70	13.70	1.42	1.38	1.39	1.39	1.39	14.45	12.55	12.61	12.62	12.63
T16_60m	1m	20.57	13.65	13.68	13.69	13.69	1.42	1.38	1.39	1.39	1.39	14.42	12.54	12.60	12.60	12.60
T16_70m	10m	20.46	13.64	13.67	13.68	13.68	1.41	1.38	1.39	1.39	1.39	14.39	12.53	12.58	12.58	12.59
T16_80m	20m	20.36	13.64	13.67	13.67	13.67	1.41	1.38	1.38	1.38	1.39	14.37	12.53	12.57	12.57	12.57
T16_90m	30m	20.28	13.63	13.66	13.66	13.67	1.41	1.38	1.38	1.38	1.38	14.35	12.52	12.56	12.56	12.56
T16_100m	40m	20.20	13.63	13.65	13.66	13.66	1.40	1.37	1.38	1.38	1.38	14.33	12.51	12.55	12.55	12.55
T16_110m	50m	20.13	13.63	13.65	13.65	10.90	1.40	1.37	1.38	1.38	1.38	14.31	12.51	12.54	12.54	12.54
T16_120m	60m	20.07	13.63	13.65	13.65	10.64	1.40	1.37	1.38	1.38	1.38	14.30	12.51	12.54	12.54	12.54
T16_130m	70m	20.01	13.62	13.64	13.64	10.45	1.40	1.37	1.38	1.38	1.38	14.28	12.50	12.53	12.53	12.53
T16_140m	80m	19.95	13.62	13.64	13.64	10.32	1.40	1.37	1.38	1.38	1.38	14.27	12.50	12.52	12.52	12.52
T16_150m	90m	19.91	13.62	13.64	13.64	10.22	1.39	1.37	1.38	1.38	1.38	14.26	12.49	12.52	12.52	12.52
T16_160m	100m	19.86	13.62	13.63	13.63	10.15	1.39	1.37	1.37	1.37	1.37	14.24	12.49	12.51	12.51	12.52
T16_170m	110m	19.82	13.61	13.63	13.63	10.09	1.39	1.37	1.37	1.37	1.37	14.23	12.49	12.51	12.51	12.51
T16_180m	120m	19.78	13.61	13.63	13.63	10.04	1.39	1.37	1.37	1.37	1.37	14.22	12.49	12.51	12.51	12.51
T16_190m	130m	19.74	13.61	13.63	13.63	10.00	1.39	1.37	1.37	1.37	1.37	14.22	12.48	12.50	12.50	12.50

