Ash Parish Council Neighbourhood Development Plan

Habitats Regulations Assessment

Ash Neighbourhood Planning Group

Project number: 60571087

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Quality information

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Revision History

Revision	Revision date	Details	Authorized	Name	Position
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2	16/11/20	Final for consultation following QB review (Christine Haggart)	JR	James Riley	Technical Director

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Table of Contents

Figures

Tables

1. Introduction

Background to the Project

1.1 AECOM has been appointed by Locality to assist in producing a report to inform Dover Council's Habitats Regulations Assessment (HRA) of the potential effects of the Revised Ash Parish Neighbourhood Plan (February 2020) on the Natura 2000 Network and Ramsar sites. The objectives of the assessment are to:

- Identify any aspects of the Neighbourhood Plan that would cause an adverse effect on the integrity of Natura 2000 sites, otherwise known as European sites (Special Areas of Conservation (SACs), Special Protection Areas (SPAs), potential SPAs (pSPAs) and, as a matter of Government policy, Ramsar 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 Ash Neighbourhood Plan is required to determine if there are any realistic linking impact pathways present between a European site and the Neighbourhood Plan and where Likely Significant Effects cannot be screened out, an analysis to inform Appropriate Assessment to be undertaken to determine if adverse effects on the integrity of the European sites will occur as a result of the Neighbourhood Plan alone or in combination.

Adopted Dover District Core Strategy (2010)

1.3 Dover District Council adopted their Core Strategy in February 2010. Neighbourhood Plans are required to be in general conformity with the relevant adopted Local Plans which in this case (until the new Local Plan is consulted upon) is The Dover Core Strategy. The Adopted Core Strategy Policy CP2: Provision for Jobs and Homes, provides for 14,000 homes within the Dover District over the Plan Period 2006 – 2026 to meet the needs across the Plan area. Within the Policy CP3: Distribution of Housing Allocations rural locations within the District have been allocated 1,200 net new homes which is approximately 8% of the total housing number allocated for the District.

1.4 Four sites were strategically allocated within the Land Allocations Local Plan, which was adopted in 2015. These were to provide approximately 200 net new dwellings by the end of the Plan period (2026). These sites were:

- Policy LA 20 – Land to the West of Chequer Lane, Ash. Estimated capacity of 90 dwellings. (Under construction 73 of 93 dwellings built out and not included in the Neighbourhood Plan)
- Policy LA 21 – Land to the South of Sandwich Road, Ash. Estimated capacity of 95 dwellings. (Policy ANP7a – Agri/Cowans Land in the Neighbourhood Plan)
- Policy LA 22 – Land at Mill Field, Ash. Estimated capacity of 10 dwellings. (built out and not included within the Neighbourhood Plan)
- Policy LA 23 – Former Council Yard, Molland Lea. Estimated capacity of 5 dwellings. (Policy ANP7b – Old Council Yard in the Neighbourhood Plan)

1.5 Policy CP7 – Green Infrastructure Network states:

"*The integrity of the existing network of green infrastructure will be protected and enhanced through the lifetime of the Core Strategy. Planning permission for development that would harm the network will only be granted if it can incorporate measures that avoid the harm arising or sufficiently mitigate its effects. Proposals that would introduce additional pressure on the existing and proposed Green Infrastructure Network will only be permitted if they incorporate quantitative and qualitative measures, as appropriate, sufficient to address that pressure. In addition, the*

Council will work with its partners to develop the Green Infrastructure Framework and implement proposed network improvements."

1.6 The supporting text of this policy goes on to say: "*There is also a particular issue within the* [green infrastructure] *network to ensure that where the Strategy's proposals are likely to have a significant effect on a Natura 2000 site(s) measures are built in to ensure that the effect is avoided or, if this is not possible, mitigated to a suitable level*" and therefore provides a level of protection to the European sites affected by the Adopted Core Strategy.

Emerging Dover District Local Plan 2020 – 2040

1.7 The Emerging Dover District Local Plan is currently in the Evidence Gathering phase. A draft Local Plan is scheduled to be released in Summer 2020[1], but is currently unavailable at the time of writing this report.

1.8 As part of the Emerging Dover District Local Plan the council undertook a Housing and Economic Land Availability Assessment (HELAA) beginning in 2017 and concluding in 2019. The purpose of the HELAA was to identify the future supply of the land in the District which is suitable, available and achievable for housing and economic development.

1.9 Three sites from the HELAA were identified as being potentially suitable for development within Ash and have thus been included in the Ash Neighbourhood Plan:

- HELAA 45 Land South of Mill Field. Estimated capacity of 9 dwellings (Policy ANP7c)
- HELAA 95 Land North of Molland Lane. Estimated capacity of 105 dwelling (Policy ANP7d)
- HELAA 163 Land south of Guilton. Estimated capacity of 9 dwellings (Policy ANP7e)

Legislation

1.10 The need for HRA is set out within the Conservation of Habitats & Species Regulations 2017 (as amended) and relates to protection of European sites.

1.11 European sites (also called Natura 2000 sites) 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 Natura 2000 sites.

Box 1: The legislative basis for Appropriate Assessment

Conservation of Habitats and Species Regulations 2017 (as amended)

With specific reference to Neighbourhood Plans, Regulation 106(1) states that:

"*A qualifying body which submits a proposal for a neighbourhood development plan must provide such information as the competent authority* [the Local Planning Authority] *may reasonably require for the purpose of the assessment under regulation 105…* [which sets out the formal process for determination of 'likely significant effects' and the appropriate assessment']*."*

1.12 It is therefore important to note that this report has two purposes:

- To assist the Qualifying Body (Ash Parish Council) in preparing their plan by recommending (where necessary) any adjustments required to protect European sites, thus making it more likely their plan will be deemed compliant with the Conservation of Habitats and Species Regulations 2017 (as amended); and
- On behalf of the Qualifying Body, to assist the Local Planning Authority (Dover District Council) to discharge their duty under Regulation 105 (in their role as 'plan-making authority'

[1] https://www.dover.gov.uk/Planning/Planning-Policy-and-Regeneration/New-District-Local-Plan/Home.aspx [Accessed 15/04/2020]

within the meaning of that regulation) and Regulation 106 (in their role as 'competent authority').

1.13 As 'competent authority', the legal responsibility for ensuring that a decision of 'likely significant effects' is made, for ensuring an 'appropriate assessment' (where required) is undertaken, and for ensuring Natural England are consulted, falls on the local planning authority. However, they are entitled to request from the Qualifying Body the necessary information on which to base their judgment and that is a key purpose of this report.

1.14 The Habitats Regulations applies the precautionary principle to Natura 2000 sites (SAC and SPA). As a matter of UK Government policy, Ramsar sites are given equivalent status. For the purposes of this assessment candidate SACs (cSACs), potential SPAs (pSPAs) and proposed Ramsar (pRamsar) sites are all treated as fully designated sites. In this report we use the term "European sites" to refer collectively to the sites listed in this paragraph.

1.15 Plans and projects can only be permitted having ascertained that there will be no adverse effect on the integrity of the site(s) in question. This contrasts with the SEA Regulations which do not prescribe how plan or programme proponents should respond to the findings of an environmental assessment; merely that the assessment findings (as documented in the 'environmental report') should be 'taken into account' during preparation of the plan or programme. In the case of the Habitats Regulations, 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.

1.16 There has also been a change (April 2018) as to which stage mitigation can be applied during a Habitats Regulations Assessment. The Court of Justice of the European Union published its ruling in the Case C323/17 (known as 'People Over Wind') with regards to the Habitats Directive. This judgement states that the Habitats Directive "*must be interpreted as meaning that, in order to determine whether it is necessary to carry out, subsequently, an appropriate assessment of the implications, for a site concerned, of a plan or project, it is not appropriate, at the screening stage, to take account of the measures intended to avoid or reduce the harmful effects of the plan or project on that site*".

1.17 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 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

1.18 **Chapter 2** of this report explains the process by which the HRA has been carried out. **Chapter 3** explores the relevant pathways of impact. **Chapter 4** summarises the Test of Likely Significant Effects of the policies and site allocations of the Plan considered 'alone' and 'in-combination. (The Test of Likely Significant Effects itself is undertaken in **Appendix A**). **Chapter 5** contains the Appropriate Assessment for any linking impact pathways that could not be screened out from potentially resulting in a Likely Significant Effect. **Chapter 6** contains the conclusion and a summary of recommendations.

Consultation

1.19 Consultation on the emerging Neighbourhood Plan was undertaken with Dover District Council who responded within the SEA and HRA Screening Option Report Produced by LUC in November 2019.

1.20 LUC could not rule out likely significant effects within their screening report and concluded that an appropriate assessment would be required for the Ash NP HRA. The impacts that the report highlighted to include within the appropriate assessment were:

- Physical damage/loss of habitat with respect to Thanet Coast and Sandwich Bay SPA/Ramsar site and Stodmarsh SPA/Ramsar site;
- No-physical disturbance with respect to Thanet Coast and Sandwich Bay SPA/Ramsar site and Stodmarsh SPA/Ramsar site;
- Air pollution with respect to Sandwich Bay SAC and Thanet Coast and Sandwich Bay SPA/Ramsar site;
- Recreational pressure with respect to Sandwich Bay SAC and Thanet Coast and Sandwich Bay SPA/Ramsar site; and,
- Water quality/quantity with respect to Stodmarsh SAC and Stodmarsh SPA/Ramsar site.

1.21 Consultation on the scope of HRA was also undertaken with Natural England who responded in a letter dated 20th January 2019. Natural England concurred with the conclusions within the HRA screening opinion, that an appropriate assessment would need to be undertaken.

1.22 The main issues raised by Natural England were:

- Water quality/quantity with respect to Stodmarsh SAC, SPA/Ramsar site; and,
- Recreational disturbance with respect to Thanet Coast and Sandwich Bay SPA.

1.23 The letter highlighted that the appropriate assessment of the Ash NP HRA would need to consider the existing nutrient and conservation status of receiving waters and provide certainty over mitigation measures to achieve nutrient neutrality within the Stodmarsh European sites. The assessment of recreational behaviour will also need to take into consideration the most recent visitor survey information collected by Dover District Council for their Local Plan Review and should consider the alone and in-combination effects based on this information with other projects and plans.

1.24 Each of these issues will be discussed within the appropriate assessment of this report.

2. Methodology

Introduction

2.1 This section sets out the approach and methodology for undertaking the Habitats Regulations Assessment (HRA). HRA itself operates independently from the Planning Policy system, being a legal requirement of a discrete Statutory Instrument. Therefore, there is no direct relationship to the National Planning Policy Framework (NPPF) and the 'Tests of Soundness'.

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 guidance[2] (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:

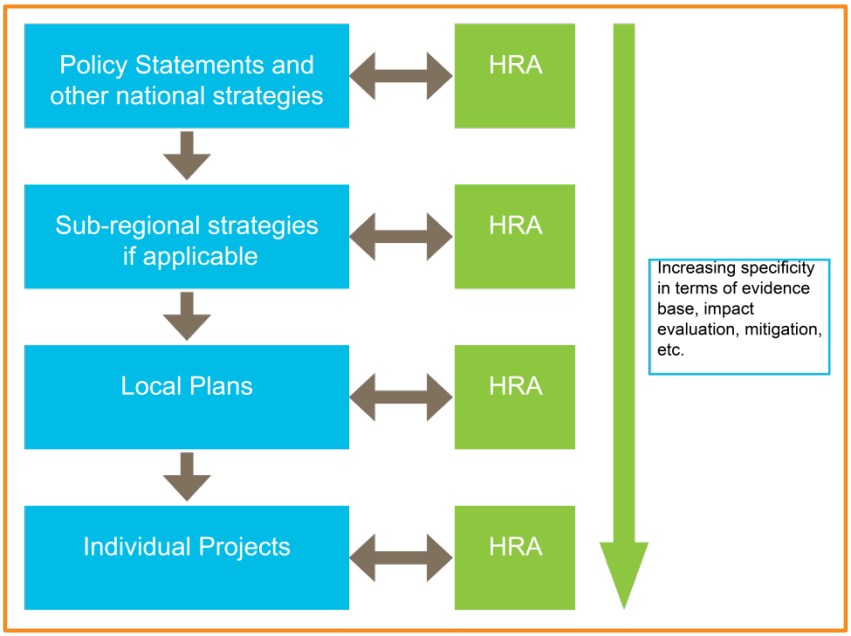
2.4 "The comprehensiveness of the [Appropriate] *assessment work undertaken should be proportionate to the geographical scope of the option and the nature and extent of any effects identified. An AA need not be done in any more detail, or using more resources, than is useful for its purpose. It would 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."*

2.5 More recently, the Court of Appeal[3] ruled that providing the Council (competent authority) was duly satisfied that proposed mitigation could be "*achieved in practice"* to satisfy that the proposed development would have no adverse effect, then this would suffice. 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"*.

2.6 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, 17th 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



2.7 For a plan the level of detail concerning the developments that will be delivered is usually insufficient to make a highly detailed assessment of significance of effects. For example, precise and full determination of the impacts and significant effects of a new settlement will require extensive details concerning the design of the new housing sites, including layout of greenspace and type of development to be delivered in particular locations, yet these data will not be decided until subsequent stages.

2.8 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.

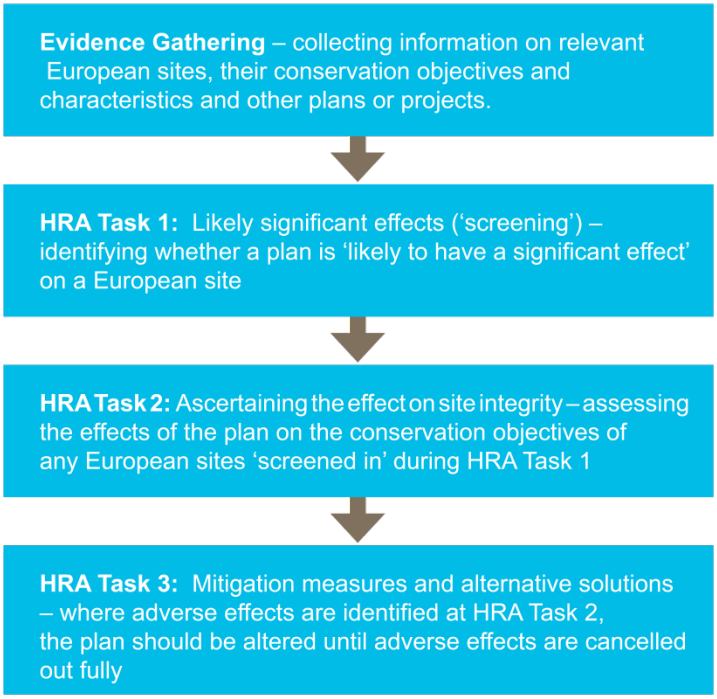
The Process of HRA

2.9 The HRA is being carried out in the continuing absence of formal central Government guidance. The former DCLG (now MHCLG) released a consultation paper on AA of Plans in 2006[5]. As yet, no further formal guidance has emerged from MHCLG. However, Natural England has produced its own informal internal guidance and central government have released general guidance on appropriate assessment[6].

2.10 **Box 3** outlines the stages of HRA according to the draft MHCLG guidance (which, as government guidance applicable to English authorities is considered to take precedence over other sources of 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] MHCLG (2006) Planning for the Protection of European Sites, Consultation Paper
[6] https://www.gov.uk/guidance/appropriate-assessment

Box 3: Four-Stage Approach to Habitats Regulations Assessment



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

Task One: Test of Likely Significant Effect

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

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

2.14 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 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

2.15 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.

2.16 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.

2.17 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 Scope

2.18 There is no guidance that dictates the physical scope of an HRA of a plan. Therefore, in considering the physical scope of the assessment we were 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 Neighbourhood Plan area boundary; and
- Other sites shown to be linked to development within the Neighbourhood Plan boundary through a known "pathway" (discussed below).

2.19 Briefly defined, 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, MHCLG 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[7]).

2.20 Locations of European sites are illustrated in **Appendix A, Figure 1**, and full details of all European sites discussed in this document can be found in **Appendix B**. specifying their qualifying features, conservation objectives and threats to integrity. Table 1 below lists all those European sites included in this HRA.

2.21 **Note** that the inclusion of a European site or pathway below does not indicate that an effect is expected but rather that these are pathways that will be investigated.

2.22 On behalf of Dover District Council, the consultancy Land Use Consultants (LUC) produced an SEA and HRA Screening Opinion (effectively Dover District Council's formal test of Likely Significant Effects) relating to the Ash Parish Council Neighbourhood Development Plan in November 2019[8]. This effectively screened out several European sites within 15 km of the Parish boundary for which the Neighbourhood Plan did not cause a likely significant effect[9]. Therefore, to avoid repetition the sites included within the scope of this report are those which could not be screened out by Dover District Council at the Screening stage. The report that follows will form the Appropriate Assessment of the Habitats Regulations Assessment process. However, although Dover District Council screened in the plan for Appropriate Assessment, the Council's consultants did not scrutinise individual policies within the Ash Neighbourhood Plan and therefore the first section of this report presents a test of Likely Significant Effects of each policy as it relates to the European sites scoped into the HRA by the LUC Scoping report.

[7] Now MHCLG.
[8] LUC 2019. Ash Parish Council Neighbourhood Development Plan SEA and HRA Screening Opinion. Dover District Council.
[9] European sites within 15km of Ash Parish which were screened out, as no likely significant effects, within the LUC SEA and HRA Screening Opinion Report 2019 were: Dover to Kingsdown Cliffs SAC, Lydden and Temple Ewell Downs SAC, Blean Complex SAC, Thanet Coast SAC, Tankerton Slopes and Swalecliffe SAC, Margate and Long Sands SAC and Outer Thames Estuary SPA.

Table 1: Physical Scope of the HRA

European Designated Site	Location	Reason for Inclusion[10] associated with the European site that could link to the Plan.
Thanet Coast and Sandwich Bay SPA and Ramsar Site	225m east of Parish Boundary 4.2 km east of closest allocation.	– Air Pollution – Recreational Pressure
Sandwich Bay SAC	225m east of Parish Boundary 4.2 km east of closest allocation.	– Air pollution – Recreational Pressure
Stodmarsh SPA and Ramsar Site	2.9 km west of Parish Boundary 5.5 km west of closest allocation	– Air Pollution – Water Quality
Stodmarsh SAC	2.9 km west of Parish Boundary 5.5 km west of closest allocation	– Air Pollution – Water Quality

The "In Combination" Scope

2.23 It is a requirement of the Regulations that the impacts and effects of any land use plan being assessed are not considered alone but in combination with other plans and projects that may also be affecting the European designated site(s) in question.

2.24 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 Waddenzee[11] case.

2.25 For the purposes of this assessment, we have determined that, due to the nature of the identified impacts, the key other plans and projects with potential for in combination likely significant effects are those schemes that have the following impact pathways: Disturbance (including urbanisation and recreational pressure), changes in hydraulic conditions and loss of functionally linked land. The following plans have been assessed for their in-combination impact to interact with the Neighbourhood Plan:

- Dover District Council (2010). Core Strategy
- Southern Water (2019). Water Resources Management Plan 2020 – 2070
- Southern Water (2019). Drought Plan
- Dover District Council (2012). Thanet Coast SPA Mitigation Strategy.
- Dover District Council (2014). Green Infrastructure Strategy.
- Thanet District Council Local Plan to 2031 (Examination Draft)

2.26 It should be noted that, while the broad potential impacts of these other projects and plans will be considered, we do not propose carrying out full HRA on each of these plans – we will however draw upon existing HRA that have been carried out for surrounding regions and plans.

[10] As identified by LUC in the SEA and HRA Screening Opinion.
[11] Waddenzee case (Case C-127/02, [2004] ECR-I 7405)

3. Pathways of Impact

3.1 The following pathways of impact are considered relevant to the HRA of the Plan:

- Recreational pressure
- Water quality
- Air pollution (atmospheric nitrogen deposition to sand dune and saltmarsh within 200m of the A256)

Recreational Pressure

3.2 Recreational use of a European site has the potential to:

- Cause disturbance to sensitive species, particularly ground-nesting birds and (where relevant) wintering wildfowl.
- Cause damage through erosion and fragmentation;
- Cause eutrophication as a result of dog fouling; and
- Prevent appropriate management or exacerbate existing management difficulties;

3.3 Different types of European sites are subject to different types of recreational pressures and have different vulnerabilities. Studies across a range of species have shown that the effects from recreation can be complex.

3.4 It should be emphasised that recreational use is not inevitably a problem. Many European sites also contain nature reserves managed for conservation and public appreciation of nature.

3.5 HRAs of Local Plans tend to focus on recreational sources of disturbance as a result of new residents[12].

Activities causing disturbance

3.6 Disturbing activities are on a continuum. The most disturbing activities are likely to be those that involve irregular, infrequent, unpredictable loud noise events, movement or vibration of long duration. The presence of people and dogs generate a substantial disturbance effects because of the areas accessed and the impact of a potential predator on bird behaviour. Birds are least likely to be disturbed by activities that involve regular, frequent, predictable, quiet patterns of sound or movement or minimal vibration. The further any activity is from the birds, the less likely it is to result in disturbance.

3.7 The factors that influence a species response to a disturbance are numerous, but the three key factors are species sensitivity, proximity of disturbance sources and timing/duration of the potentially disturbing activity.

3.8 The distance at which a species takes flight when approached by a disturbing stimulus is known as the 'tolerance distance' (also called the 'escape flight distance') and differs between species to the same stimulus and within a species to different stimuli.

3.9 The potential for apparent disturbance may be less in winter than in summer, in that there are often a smaller number of recreational users. In addition, the consequences of disturbance at a population level may be reduced because birds are not breeding. However, activity outside of the summer months can still cause important disturbance, especially as birds are particularly vulnerable at this time of year due to food shortages. Disturbance which results in abandonment of suitable feeding areas can have severe consequences for those birds involved and their ability to find alternative feeding areas. Several empirical studies have, through correlative analysis,

[12] The RTPI report 'Planning for an Ageing Population '(2004) which states that 'From being a marginalised group in society, the elderly are now a force to be reckoned with and increasingly seen as a market to be wooed by the leisure and tourist industries. There are more of them and generally they have more time and more money.' It also states that 'Participation in most physical activities shows a significant decline after the age of 50. The exceptions to this are walking, golf, bowls and sailing, where participation rates hold up well into the 70s'.

demonstrated that out-of-season (October-March) recreational activity can result in quantifiable disturbance:

- Tuite et al[13] found that during periods of high recreational activity, bird numbers at Llangorse Lake decreased by 30% as the morning progressed, matching the increase in recreational activity towards midday. During periods of low recreational activity, however, no change in numbers was observed as the morning progressed. In addition, all species were found to spend less time in their 'preferred zones' (the areas of the lake used most in the absence of recreational activity) as recreational intensity increased;
- Underhill et al[14] counted waterfowl and all disturbance events on 54 water bodies within the South West London Water Bodies Special Protection Area and clearly correlated disturbance with a decrease in bird numbers at weekends in smaller sites and with the movement of birds within larger sites from disturbed to less disturbed areas.

3.1 Human activity can affect birds either directly (e.g. through causing them to flee) or indirectly (e.g. through damaging their habitat). The most obvious direct effect is that of immediate mortality such as death by shooting, but human activity can also lead to behavioural changes (e.g. alterations in feeding behaviour, avoidance of certain areas *etc.*) and physiological changes (e.g. an increase in heart rate) that, although less noticeable, may ultimately result in major population-level effects by altering the balance between immigration/birth and emigration/death[15]. The impact of disturbance on birds changes during the seasons in relation to a number of very specific factors, for example the winter below freezing temperature, the bird's fat resource levels and the need to remain watchful for predators rather than feeding. These considerations lead to birds apparently showing different behavioural responses at different times of the year.

3.2 The degree of impact that varying levels of noise will have on different species of bird is poorly understood except that a number of studies have found that an increase in traffic levels on roads does lead to a reduction in the bird abundance within adjacent hedgerows - Reijnen et al (1995) examined the distribution of 43 passerine species (i.e. 'songbirds'), of which 60% had a lower density closer to the roadside than further away. By controlling vehicle usage, they also found that the density generally was lower along busier roads than quieter roads[16].

Mechanical/abrasive damage and nutrient enrichment

3.3 Most types of aquatic or terrestrial European site can be affected by trampling, which in turn causes soil compaction and erosion:

- Wilson & Seney (1994)[17] examined the degree of track erosion caused by hikers, motorcycles, horses and cyclists from 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 al (1995a, b)[18] conducted experimental off-track trampling in 18 closed forest, dwarf scrub and meadow & grassland communities (each tramped between 0 – 500 times) over five mountain regions in the US. Vegetation cover was assessed two weeks and one year after trampling, and an inverse relationship with trampling intensity was discovered, although this relationship was weaker after one year than two weeks indicating some recovery of the vegetation. Differences in plant morphological

[13] Tuite, C. H., Owen, M. & Paynter, D. 1983. Interaction between wildfowl and recreation at Llangorse Lake and Talybont Reservoir, South Wales. *Wildfowl* 34: 48-63
[14] Underhill, M.C. et al. 1993. Use of Waterbodies in South West London by Waterfowl. An Investigation of the Factors Affecting Distribution, Abundance and Community Structure. Report to Thames Water Utilities Ltd. and English Nature. Wetlands Advisory Service, Slimbridge
[15] Riley, J. 2003. Review of Recreational Disturbance Research on Selected Wildlife in Scotland. Scottish Natural Heritage.
[16] Reijnen, R. et al. 1995. The effects of car traffic on breeding bird populations in woodland. III. Reduction of density in relation to the proximity of main roads. Journal of Applied Ecology 32: 187-202
[17] 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
[18] 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

characteristics were found to explain more variation in response between different vegetation types 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. 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 most resilient to trampling. Chamaephytes (plants with buds above the soil surface) were least resilient to trampling. It was concluded that these would be the least tolerant of a regular cycle of disturbance.

- Cole (1995c)[19] conducted a follow-up study (in 4 vegetation types) in which shoe type (trainers or walking boots) and trampler weight were varied. Although immediate damage was greater with walking boots, there was no significant difference after one year. Heavier tramplers caused a greater reduction in vegetation height than lighter tramplers, but there was no difference in effect on cover.
- Cole & Spildie (1998)[20] experimentally compared the effects of off-track trampling by hiker and horse (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). Horse traffic was found to cause the largest reduction in vegetation cover. The forb-dominated vegetation suffered greatest disturbance but recovered rapidly. Higher trampling intensities caused more disturbance.

3.4 Walkers with dogs contribute to pressure on sites through nutrient enrichment via dog fouling and also cause greater disturbance to fauna as dogs are less likely to keep to marked footpaths and also tend to move in a more erratic manner. Sites being managed by nature conservation bodies and local authorities frequently resort to hardening eroded paths to restrict erosion but at the same time they are losing the habitats formerly used by sand lizards and burrowing invertebrates. Motorcycle scrambling and off-road vehicle use can cause more serious erosion, as well as disturbance to sensitive species. Boats can also cause some mechanical damage to intertidal habitats through grounding as well as anchor and anchor line damage.

Water Quality

3.5 Increased amounts of housing or business development can lead to reduced water quality of rivers and estuarine environments. Sewage and industrial effluent discharges can contribute to increased nutrients on European sites leading to unfavourable conditions. In addition, diffuse pollution, partly from urban run-off has been identified during an Environment Agency Review of Consents process and a joint Environment Agency and Natural England evidence review, as being a major factor in causing unfavourable condition of European sites.

3.6 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. 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. In the marine environment, nitrogen is the limiting plant nutrient and so eutrophication is associated with discharges containing available nitrogen;

[19] 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.
[20] 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

- Some pesticides, industrial chemicals, and components of sewage effluent are suspected to interfere with the functioning of the endocrine system, possibly having negative effects on the reproduction and development of aquatic life; and
- Increased discharge of treated sewage effluent can result both in high levels of macroalgal growth, which can smother the mudflats of value to SPA birds and in greater scour (as a result of greater flow volumes).

3.7 At sewage treatment works, additional residential development increases the risk of effluent escape into aquatic environments in addition to consented discharges to the catchment. In many 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.

3.8 The water environment within the Stour catchment is one of the most important for water dependent wildlife in the United Kingdom. There are high levels of nitrogen and phosphorous input to this water environment with sound evidence that these nutrients are causing eutrophication at part of the Stour European sites. It is thought that the main sources of these nutrients are wastewater from housing developments and agricultural sources.

3.9 There is the potential for new housing developments within the Stour catchment to contribute further to the nutrient input into the European sites. Currently wastewater treatment plants are under investigation with regards to their impact to the Stodmarsh European sites and this will be reported in 2022 by the Environment Agency Water Industry National Environment Program (WINEP); however, until the report is published there remains uncertainty and therefore new residential development within the Stour catchment must ensure they achieve nutrient neutrality.

3.10 Natural England have produced advice and a methodology to assess and mitigate nutrient inputs into the Stodmarsh European sites with the Advice on Nutrient Neutrality for New Development in the Stour Valley Catchment in Relation to Stodmarsh Designated Sites – For Local Planning Authorities, December 2019 Report.

3.11 Natural England advises that a nutrient budget for total nitrogen (TN) and total phosphorous (TP) can be calculated for new developments. This can then be used to show that the development either avoids harm to protected sites from water quality issues or provides the level of mitigation required to ensure that there is no adverse effect with respect to nutrients.

3.12 Nutrient budgets will be calculated within this HRA for any wastewater treatments connected to developments within the Ash Parish boundary which feed into the Stour European sites.

Atmospheric Pollution (Atmospheric Nitrogen Deposition)

3.13 The main pollutants of concern for European sites are oxides of nitrogen (NO_x), ammonia (NH_3) and sulphur dioxide (SO_2). NO_x can have a directly toxic effect upon vegetation. In addition, greater NO_x or ammonia concentrations within the atmosphere will lead to greater rates of nitrogen deposition to soils. An increase in the deposition of nitrogen from the atmosphere to soils is generally regarded to lead to an increase in soil fertility, which can have a serious deleterious effect on the quality of semi-natural, nitrogen-limited terrestrial habitats.

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

Pollutant	Source	Effects on habitats and species
Acid deposition	SO_2, NO_x and ammonia all contribute to acid deposition. Although future trends in S emissions and subsequent deposition to terrestrial and aquatic ecosystems will continue to decline, it is likely that increased nitrogen emissions may cancel out any gains produced by reduced sulphur levels.	Can affect habitats and species through both wet (acid rain) and dry deposition. Some sites will be more at risk than others depending on soil type, bed rock geology, weathering rate and buffering capacity.

Ammonia (NH_3)	Ammonia is released following decomposition and volatilisation of animal wastes. It is a naturally occurring trace gas, but levels have increased considerably with expansion in numbers of agricultural livestock. Ammonia reacts with acid pollutants such as the products of SO_2 and NO_X emissions to produce fine ammonium (NH_4^+) containing aerosol which may be transferred much longer distances (can therefore be a significant trans-boundary issue.)	Adverse effects are from direct toxicity and as a result of nitrogen deposition leading to eutrophication. As emissions mostly occur at ground level in the rural environment and NH_3 is rapidly deposited, some of the most acute problems of NH_3 deposition are for small relict nature reserves located in intensive agricultural landscapes.
Nitrogen oxides NO_x	Nitrogen oxides are mostly produced in combustion processes. About one quarter of the UK's emissions are from power stations.	Deposition of nitrogen compounds (nitrates (NO_3), nitrogen dioxide (NO_2) and nitric acid (HNO_3)) can lead to both soil and freshwater acidification. In addition, NO_x can cause eutrophication of soils and water. This alters the species composition of plant communities and can eliminate sensitive species.
Nitrogen (N) deposition	The pollutants that contribute to nitrogen deposition derive mainly from NO_X and NH_3 emissions. These pollutants cause acidification (see also acid deposition) as well as eutrophication.	Species-rich plant communities with relatively high proportions of slow-growing perennial species and bryophytes are most at risk from N eutrophication, due to its promotion of competitive and invasive species which can respond readily to elevated levels of N. N deposition can also increase the risk of damage from abiotic factors, e.g. drought and frost.
Ozone (O_3)	A secondary pollutant generated by photochemical reactions from NO_x and volatile organic compounds (VOCs). These are mainly released by the combustion of fossil fuels. The increase in combustion of fossil fuels in the UK has led to a large increase in background ozone concentration, leading to an increased number of days when levels across the region are above 40ppb. Reducing ozone pollution is believed to require action at international level to reduce levels of the precursors that form ozone.	Concentrations of O_3 above 40 ppb can be toxic to humans and wildlife and can affect buildings. Increased ozone concentrations may lead to a reduction in growth of agricultural crops, decreased forest production and altered species composition in semi-natural plant communities.
Sulphur Dioxide SO_2	Main sources of SO_2 emissions are electricity generation, industry and domestic fuel combustion. May also arise from shipping and increased atmospheric concentrations in busy ports. Total SO_2 emissions have decreased substantially in the UK since the 1980s.	Wet and dry deposition of SO_2 acidifies soils and freshwater and alters the species composition of plant and associated animal communities. The significance of impacts depends on levels of deposition and the buffering capacity of soils.

3.14 Sulphur dioxide emissions are overwhelmingly influenced by the output of power stations and industrial processes that require the combustion of coal and oil. Ammonia emissions are dominated by agriculture, with some chemical processes also making notable contributions. As such, it is unlikely that material increases in SO_2 or NH_3 emissions will be associated with Local

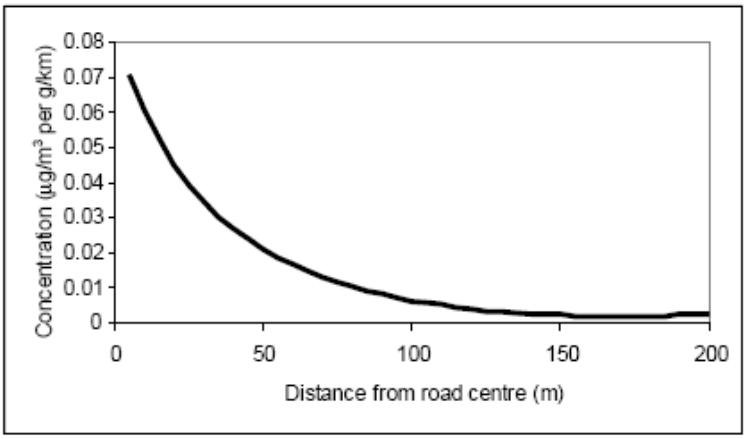
Plans. NO_x emissions, however, are dominated by the output of vehicle exhausts. Within a 'typical' housing development, by far the largest contribution to NO_x (92%) will be made by the associated road traffic. Other sources, although relevant, are of minor importance (8%) in comparison[21]. Emissions of NO_x could therefore be reasonably expected to increase as a result of greater vehicle use as an indirect effect of the LDF.

3.15 According to the World Health Organisation, the critical NO_x concentration (critical threshold) for the protection of vegetation is 30 μgm^{-3}; the threshold for sulphur dioxide is 20 μgm^{-3}. In addition, ecological studies have determined 'Critical Loads'[22] of atmospheric nitrogen deposition (that is, NO_x combined with ammonia NH_3) for key habitats within European sites.

Local Air Pollution

3.16 According to the Department of Transport's Transport Analysis Guidance, "Beyond 200 m, the contribution of vehicle emissions from the roadside to local pollution levels is not significant"[23].

Plate 1. Traffic contribution to concentrations of pollutants at different distances from a road (Source: DfT)



3.17 This is therefore the distance that is used throughout the HRA process in order to determine whether a European site is likely to be significantly affected by development under a Plan.

4. Test of Likely Significant Effects

Introduction

4.1 The initial scoping of European sites illustrated in Table 1 identifies that some sites are potentially vulnerable to:

- Recreational pressure;
- Water quality; and,
- Air pollution.

4.2 The full test of Likely Significant Effects for the Ash Parish Neighbourhood Plan policies is presented in Appendix B. The assessment took into consideration the above potential vulnerabilities of the European sites included in Table 1.

[21] 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
[22] The Critical Load is the rate of deposition beyond which research indicates that adverse effects can reasonably be expected to occur
[23] www.webtag.org.uk/archive/feb04/pdf/feb04-333.pdf

4.3 The following sections focus on:

- Thanet Coast and Sandwich Bay SPA and Ramsar Site
- Sandwich Bay SAC
- Stodmarsh SPA and Ramsar Site
- Stodmarsh SAC

4.4 None of these European sites are present within the Neighbourhood Area and therefore will not cause likely significant effect upon the European sites alone. Therefore, the following sections will focus on the 'in-combination' effects.

Summary of Test of Likely Significance 'In-Combination'

Policy Screening Summary

4.5 Of the 20 Neighbourhood Plan policies, five policies were considered to have the potential to result in likely significant effect in-combination;

- Policy ANP7a – Agri/Cowan's Land – this policy is one of the site allocations and allocates a total of 95 dwellings.
- Policy ANP7b – Old Council Yard – this is one of the site allocations and allocates a total of five dwellings.
- Policy ANP7c – Land South of Mill Field – this is one of the site allocations and allocates a total of 12 dwellings.
- Policy ANP7d – Land North of Molland Lane – this is one of the site allocations and allocates a total of 114 dwellings.
- Policy ANP7e – Land South of Guilton – this is one of the site allocations and allocates a total of 9 dwellings.

4.6 The above policies provide for the following realistic potential linking impact pathways that could result in likely significant effects on European sites in combination:

- Recreational pressure: as a result of new residential dwellings increasing the number of visitors within the sensitive European sites (Policy 7a to 7e).
- Air quality: as a result of increased journeys to work and increased local residents driving to European sites (Policies 7a to 7e).
- Water quality: increased effluent as a result of increased residential dwellings (Policies 7a to 7e).

4.7 All remaining policies are development management policies that do not provide impact pathways that could potentially link to European sites.

European Site Vulnerabilities

Thanet Coast and Sandwich Bay SPA and Ramsar

4.8 Sandwich Bay is the longest continuous stretch of chalk coastline in Britain. The habitats along the coast provide valuable feeding grounds and roosting areas for wintering waders, golden plover and turnstone and breeding populations of little tern. The European site at its closest is approximately 225m east of the Neighbourhood Area, however it is approximately 4.2km from the closest allocation. The site has been identified to be vulnerable to increased disturbance

through **recreational pressure**, **non-physical disturbance** and **air pollution through increases in atmospheric nitrogen deposition.**

Sandwich Bay SAC

4.9 Sandwich Bay qualifies for its fixed dunes with herbaceous vegetation, embryonic shifting dues, shifting dues with marram grass and dunes with creeping willow. The European site at its closest is approximately 225m east of the Neighbourhood Area, however it is approximately 4.2km from the closest allocation. The site has been identified to be vulnerable to increased disturbance though **recreational pressure** and **air pollution through increases in atmospheric nitrogen deposition.**

Stodmarsh SPA and Ramsar

4.10 Stodmarsh is a wetland comprising open waterbodies, reedbeds, grazing marsh and alder-carr. The site provides wintering and breeding habitats for important assemblages of wetland bird species. The European site at its closest is approximately 2.9km west of the Neighbourhood Area, however, it is approximately 5.5km west of the closest allocation. The site has been identified to be vulnerable to increased disturbance through **air pollution through increases in atmospheric nitrogen deposition**, **non-physical disturbance** and **water pollution.**

Stodmarsh SAC

4.11 The site supports Desmoulin's whorl snail which occurs on emergent vegetation in fen areas and along ditches in the grazing marsh. The European site at its closest is approximately 2.9km west of the Neighbourhood Area, however, it is approximately 5.5km west of the closest allocation. The site has been identified to be vulnerable to **air pollution through increases in atmospheric nitrogen deposition** and **water pollution**.

Potential Impact Pathways

Recreational Pressure

4.12 Recreational pressure is a known impact pathway upon the Thanet Coastal European Sites and a mitigation strategy has been designed for the area. As mitigation cannot be taken into consideration at the Screening Stage of the HRA process, **recreational pressure will be discussed further within the Appropriate Assessment of this report.**

Water Quality

4.13 Increased quantities of housing development can lead to reduced water quality of rivers and estuarine environments. Sewage effluent discharges can contribute to increased nutrients on European sites leading to unfavourable conditions. In addition, diffuse pollution, partly from urban run-off has been identified during an Environment Agency Review of Consents process and a joint Environment Agency and Natural England evidence review, as being a major factor in causing unfavourable conditions of European Sites.

4.14 The water environment within the Stour catchment is one of the most important for water dependant wildlife in the UK. There are high levels of nitrogen and phosphorous input into the water environment with sound evidence that these nutrients cause eutrophication at part of the Stodmarsh designated sites[24]. As this is a known issue for the Stour catchment, the allocations within the Ash Parish Neighbourhood Area may contribute in-combination to the increased eutrophication of the Stodmarsh designated sites. Therefore, **water quality will be discussed further within the Appropriate Assessment of this report.**

[24] Advice on Nutrient Neutrality for New Development in the Stour Valley Catchment in Relation to Stodmarsh Designated Sites – For Local Planning Authorities. Natural England, December 2019.

Non-Physical Disturbance

4.15 Non-physical disturbance incorporates a range of pathways including noise, vibration, visual presence, human presence and light pollution and can be cause by a range of activities including development itself e.g. housing/industrial buildings, recreation e.g. walking, dog walking, vehicular activity and artificial lighting.

4.16 Non-physical disturbance has been highlighted by LUC on behalf of Dover Council as a potential impact pathway for both Thanet Coast and Sandwich Bay SPA and Ramsar and Stodmarsh SPA and Ramsar, as they both have highly mobile qualifying features e.g. birds. Both of these SPA and Ramsar sites are located outside of the Parish and the nearest allocations are at least 4.3km west of the Thanet Coast and Sandwich Bay SPA and Ramsar and 6.0km east of Stodmarsh SPA and Ramsar site.

4.17 Three of the allocation sites are under 1 ha (ANP7b, ANP7c and ANP7e), two of which are brownfield (ANP7b and ANP7e). These three sites are therefore unsuitable for supporting significant numbers of foraging qualifying species such as golden plover. The fourth site is larger 3ha (ANP7a); however, it is surrounded on three sides by urban development and a minor road on the remaining side and the site is heavily grazed in areas by horses. Therefore, this is also unsuitable for foraging golden plover. The fifth site (ANP7d) is the largest at 4.4 ha and is an arable field. However, the site is also bounded on two sides by urban development and on the third by a raised bank of trees next to the A257. As the field is bordered on two sides by development and a third by a busy main road as well at the bank of trees which reduces sight lines for the birds, this site is also considered to be unsuitable for foraging plover.

4.18 As all sites are unsuitable to be functionally linked land, the Appropriate Assessment of this report will focus on the potential for non-physical disturbance such as noise vibration and light with regards to potential functionally linked land around the allocations during construction and operation.

Air Pollution

4.19 The main pollutants of concern for European sites are oxides of nitrogen (NO_x), ammonia (NH_3) and sulphur dioxide (SO_2). NO_x can have a directly toxic effect upon vegetation. In addition, greater NO_x or ammonia concentrations within the atmosphere will lead to greater rates of nitrogen deposition to soils. An increase in the deposition of nitrogen from the atmosphere to soils is generally regarded to lead to an increase in soil fertility, which can have a serious deleterious effect on the quality of semi-natural, nitrogen-limited terrestrial habitats.

4.20 Within this HRA a zone of 10km is used to screen in European sites vulnerable to reductions in air quality. This is based on the average UK car journey being approximately 10.6km[25]. Therefore, all sites within this zone are automatically considered for potential adverse effects relating to reductions in air quality within the screening section. Below the vulnerable sites within 10km of the Parish are discussed.

4.21 The SIP for the Stodmarsh SAC highlights that nitrogen deposition exceeds the site-relevant critical load. However, Stodmarsh SAC is not within 200m of any major roads between the Parish and other towns around the area. As the SAC habitats are beyond 200m of any major roads, contribution of vehicle emissions from the roadside to local pollution levels will not be significant. Air quality with regards to Stodmarsh SAC can be screened out and will not be discussed further within the HRA.

4.22 The Thanet Coast and Sandwich Bay SPA and Ramsar site and the Sandwich Bay SAC are also vulnerable to nitrogen deposition. According to the SIP[26] at these sites' nitrogen deposition exceeds the relevant critical loads for the coastal dune habitats the designated feature of the SAC and leading to a change in vegetative species diversity. The Air Pollution Information System confirms that the sand dune features of the SAC are sensitive to nitrogen deposition as is the

[25] GOV.UK (2019). *Average number of trips made and distance travelled*. https://www.gov.uk/government/statistical-data-sets/nts01-average-number-of-trips-made-and-distance-travelled, accessed 13/03/2020

[26] file:///C:/Users/amelia.kent/Downloads/SIP141008FINALv0.1%20North%20East%20Kent%20(Thanet)%20(2).pdf [Accessed 03 Apr 2020]

nesting terns through deposition to their nesting locations and the golden plover interest feature of the SPA, mainly through impacts on saltmarsh. However, the Natural England Site Improvement Plan confirms that no little terns have bred anywhere within the SPA for more than a decade. The focus will therefore be on the sand dunes as these are more sensitive to nitrogen deposition that saltmarsh and lie within 200m of the A259.

4.23 Currently the Emerging Dover District Local Plan is not at a stage to rule in or out air pollution impacts from increased quantities of residential development at a district level and therefore the Neighbourhood Plan will need to provide evidence beyond reasonable scientific doubt whether the increased residential development within the Parish will have an impact upon the Thanet Coast sites in line with the Habitats Regulations. Therefore, traffic modelling will be undertaken, and **air pollution will be discussed further within the Appropriate Assessment of this report.**

5. Appropriate Assessment

5.1 No linking impact pathways were identified for 'alone' effects therefore the following impact pathways will focus on 'in-combination' effects.

Recreational Pressure 'in-Combination'

5.2 Although the new Dover District Local Plan is currently in the evidence gathering stage at the time of writing this report Ash Parish Council have been in discussion with Dover District Council with regards to allocation of housing numbers. An acceptable number was agreed between the two councils for the unconstrained housing needs of Ash Parish over the plan period of a total of 323 for main development sites and a windfall allowance of 38 dwellings.

5.3 Within the Neighbourhood Plan, five sites have been allocated for residential development. These are:

- Policy ANP7a – Agri/Cowan's Land – allocates a total of 95 dwellings.
- Policy ANP7b – Old Council Yard – allocates a total of 5 dwellings.
- Policy ANP7c – Land South of Mill Field – allocates a total of 9 dwellings (mitigated down from 12).
- Policy ANP7d – Land North of Molland Lane – allocates a total of 105 dwellings (mitigated down from 114).
- Policy ANP7e – Land South of Guilton –allocates a total of 9 dwellings (mitigated down from 10).

5.4 In addition, the Neighbourhood Plan includes two sites which have already gained planning permission:

- Chequers Lane which is taking 73 dwellings forward (mitigated down from 90); and,
- White Post Farm which is taking 30 dwellings forward (mitigated down from 33).

5.5 Therefore, total housing numbers within the Ash Parish Neighbourhood Plan equate to 326 dwellings for the main sites and 38 windfall dwellings = 364 dwellings. However, since they have already gained permission, sites ANP7d and ANP7e are not assessed in this report, other than as part of the total quantum of growth expected across Dover District during the plan period.

5.6 The policies discussed above have the potential in-combination with other plans and projects to affect the integrity of European sites with increased recreational pressure listed as a vulnerability within the Site Improvement Plan (SIP). The European sites discussed within this HRA that are vulnerable to increased recreational pressure are:

- Thanet Coast and Sandwich Bay SPA and Ramsar site;
- Sandwich Bay SAC; and,
- Stodmarsh SPA and Ramsar site.

5.7 There is already (prior to any HRA) a clause within two of the allocation policies – Policy ANP7a and ANP7d which states:

"Planning permission will be permitted provided that:

A mitigation strategy to address any impacts on the Thanet Coast and Sandwich Bay Ramsar and SPA sites and Sandwich Bay SAC site is developed. The Strategy should consider a range of measures and initiatives".

5.8 Recreational pressure is a known issue within the Thanet Coast sites and visitor surveys have been undertaken at the site in order to ascertain a zone of impact within which residents could cause an impact upon the integrity of the European sites.

5.9 The latest data at present is a visitor survey undertaken by Footprint Ecology in 2014[27]. The survey was undertaken at four locations along the northern Thanet coast in February and March of 2014 and did not include the Sandwich Bay area of the Thanet Coast and Sandwich Bay SPA. A total of 192 visitor interviews were completed during the survey. 90% of those interviewed were local residents rather than those on holiday and 41% of visitors stated that they visited the location either most days or daily, with 65% of all visitors travelling to the site by car whereas only 32% of visitors travelled on foot. 58% of visitors were also accompanied by at least one dog.

5.10 Postcode data was analysed from those that gave it (87% of all visitors), which showed that 75% of all visitors resided within 9.8km of the SPA. As a general rule within other mitigation strategies the 75th percentile is taken as the zone of influence including in areas such as the Breckland SPA and Dorset Heaths SPA. Although the areas within the visitor survey were only those which were of interest to Canterbury Local Plan, this zone of influence has been applied throughout the entirety of the SPA, which includes all of Ash Parish. No visitors captured by the visitor survey resided within Ash Parish but the Parish is much closer to the Sandwich Bay section of the SPA which was not surveyed during the visits. Moreover, sites allocated within the NP are within 5.5km of the European site and therefore well within the Zone of Influence where potential impacts could occur.

5.11 Dover District Council created a Development Mitigation Strategy in 2012 to go alongside their 2010 Core Strategy, to mitigate the impacts of Dover District residents upon the Thanet Coast and Sandwich Bay SPA (which also includes the Sandwich Bay SAC). The methodology designed in conjunction with Natural England comprises four elements:

1. "*The ability, if necessary, to draw on funding, via a bond, to support wardening at Sandwich Bat for a period of up to 10 years;*
2. *Monitoring of potential impacts associated with Dover development to identify if and when such wardening (1) or other mitigation (4) is required;*
3. *Contribution to the Pegwell Bay and Sandwich Bay Disturbance Study to compliment point 2, provide weighting for different forms of disturbance and thus direct the role of wardening (1); and,*
4. *To use the monitoring (2) to identify lesser sources of development-related disturbance and to draw on the relevant developers' contributions for mitigation of such."*

5.12 It is generally accepted for coastal sites that wardening is the most appropriate and secure mitigation, however the Mitigation Strategy goes on to say; "*for mitigation to be proportionate there should be other tools available which can be applied incrementally, as necessary, and their effectiveness tested by monitoring. Such tools can include coastal user guidance leaflets, interpretation boards, the provision of regulations, such as dog control areas and the enforcement of such regulations*" which relate to point two and four above.

5.13 The mitigation strategy defined above requires developer contributions to fund the monitoring and other mitigation measures and this has been set from £16.53 per single bedroom dwelling up to £66.12 per four-bedroom dwelling and has been applied to sites of 15 or more dwellings. It is therefore assumed as White Post Farm (30) and Chequers Lane (73) developments have been permitted the developers have paid into the mitigation scheme. Further to these developments those that are allocated for development within the Neighbourhood Plan over 15 dwellings e.g. ANP7a (95) and ANP7d (105) will also require developer contributions into the mitigation scheme to mitigate impacts upon the Thanet Coast and Sandwich Bay SPA and Sandwich Bay SAC.

5.14 The mitigation strategy is, however, now almost 10 years old and relating to the previous Core Strategy rather than the emerging Local Plan. Within the HRA Screening Opinion (dated 20 January 2019), Natural England advise "*the Council to revisit the evidence base on recreational*

[27] Fearnley, H, Liley, D and Floyd L. (2014). Thanet Coast and Sandwich Bay SPA Visitor Survey. Unpublished report for Canterbury City Council.

disturbance to the Thanet Coast and Sandwich Bay SPA as part of the forthcoming review of their Local Plan to establish whether housing growth in Dover is likely to result in a significant effect on the SPA and therefore whether mitigation measures are required". This updated review of the mitigation strategy by the District Council during the update of the Local Plan may remove the need for developer contributions, or it may indeed strengthen mitigation measures or increase developer contributions. The Neighbourhood Plan is required to comply with the Local Plan and therefore, **it was recommended that, as the Local Plan and updated mitigation strategy is not currently available, the Neighbourhood Plan should include a policy for the protection of European sites which states compliance with the current and any future mitigation strategy produced by Dover District Council. Suggested wording was:**

"Planning permission for any development will not be supported unless:

- ***It complies with the most recent Mitigation Strategies relating to Thanet Coast and Sandwich Bay SPA and Sandwich Bay SAC, where applicable; and,***
- ***The development can evidence it will not cause an adverse effect on the integrity of any European site.*"**

5.15 This recommendation has now been included in Policy ANP1 and will apply to all allocated sites and windfall development. It can therefore be concluded that the Neighbourhood Plan will not adversely affect the integrity of vulnerable European sites with regards to recreational pressure.

Water Quality 'in-combination'

5.16 It is considered that Ash Village is hydrologically connected to Stodmarsh SAC/SPA/Ramsar (via the Wingham River and the Little Stour tributaries of the River Stour). There is therefore a risk that conversion of land from previous uses to urban development, specifically residential development could lead to an increase in treated sewage effluent (and thus nitrogen and phosphorus loading) from Dambridge WwTW, which will affect nutrient levels within the SAC/SPA/Ramsar.

5.17 Poor water quality can have a range of environmental impacts. At high levels, toxic chemicals and metals can result in the immediate death of aquatic life. At lower levels, detrimental effects can also be experienced, including increased vulnerability to disease and changes in wildlife behaviour[28].

5.18 The impacts of poor water quality entering European Sites can have far-reaching consequences similar to air quality. For example:

- 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. 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. In the marine environment, nitrogen is the limiting plant nutrient and so eutrophication is associated with discharges containing available nitrogen[29] [30].
- Some pesticides, industrial chemicals, and components of sewage effluent are suspected to interfere with the functioning of the endocrine system, possibly having negative effects on the reproduction and development of aquatic life.

5.19 Stodmarsh SPA/SAC/Ramsar supports a variety of wetland habitats including open water, reedbeds, grazing marsh and alder *Alnus glutinosa* carr. In turn, these habitats support a diversity of features that are the primary reason for SPA/SAC/Ramsar selection. Different species have

[28] Poulin, R., 1992. Toxic pollution and parasitism in freshwater fish. *Parasitology Today*, *8*(2), pp.58-61.
[29] Rabalais, N.N., 2002. Nitrogen in aquatic ecosystems. *AMBIO: A Journal of the Human Environment*, *31*(2), pp.102-113.
[30] Howarth, R.W. and Marino, R., 2006. Nitrogen as the limiting nutrient for eutrophication in coastal marine ecosystems: evolving views over three decades. *Limnology and Oceanography*, *51*(1part2), pp.364-376.

their own optimal ranges for these properties (and these can vary from season to season), and their own tolerance levels.

5.20 For example, Desmoulin's whorl snail *Vertigo moulinsiana* snail lives in permanently wet, swamps, fens and marshes, bordering rivers, lakes and ponds, or in river floodplains and is found on tall monocotyledons. For fen habitats, good water quality is one of the most important hydrological elements to ensure the continuing establishment of said habitat[31]. Poor water quality arising from pollution contaminates or changes in Biochemical Oxygen Demand (BOD) could result in the loss of supported habitat suitable to Desmoulin's whorl snail. Natural England's site improvement plan for Stodmarsh SAC/SPA/Ramsar highlights that water pollution is a current threat to the integrity of the site. Nutrient enriched water and/or contaminated water may leach into the SAC/SPA/Ramsar and degrade habitats.

5.21 As such, there is potential risk that increased sewage could degrade the water quality (i.e. through increased phosphorus discharge) of Stodmarsh SAC/SPA/Ramsar when in the absence of environmental mitigation and adequate wastewater treatment works[32].

5.22 The high levels of nitrogen and phosphorus input to the water environment in the Stour catchment generally is currently caused by wastewater from existing housing and agricultural sources, though some local and within site process can occur in lake habitats and there are suspected mine waste contamination in some areas of the Stour. There are a number of mechanisms already in place to reduce the amount of nutrient inputs within our river and lake catchments and coastal waterbodies. Within the river Stour catchment; both 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. The Stour has been a priority catchment under CSF since phase 1 (2006).

5.23 In addition, the wastewater treatment works (WwTW) that enter into the catchment of Stodmarsh are the subject of an investigation under Water Industry National Environment Programme (WINEP) which will determine the extent of the connection of WwTW and sewerage assets to the Stodmarsh lakes and to what extent the existing WwTW discharges and other company assets are contributing to the existing water quality failures and risk of failures. The WINEP program will report in 2022, therefore until the work is complete, uncertainty remains and the potential for future housing developments across the Stodmarsh catchment to exacerbate these impacts creates a risk to the site potential future conservation status. Therefore, one way to address the uncertainty is for developments to achieve nutrient neutrality.

5.24 The wastewater treatment works (WwTW) that serves the Ash Parish is Dambridge WwTW. This WwTW feeds into Wingham River and further down the Little Stour and is considered by Natural England to be hydrologically connected to Stodmarsh SAC/SPA/Ramsar via the floodplains surrounding the European site. As a result of the WwTW location and hydrological relationship to the European site, nutrient neutrality calculations were undertaken to investigate if residential development in Ash would impact European Site integrity.

5.25 Any new residential development in Ash as a result of the Neighbourhood Plan has potential to result in increased levels of nutrients entering Stodmarsh SAC/SPA/Ramsar. While levels of development in the Neighbourhood Plan are modest in itself (i.e. 223 dwellings), this will operate cumulatively with all other existing and future development connected to the Stodmarsh catchment.

5.26 Natural England advises that a nutrient budget (TN and TP) can be calculated for new developments and has provided a guidance document to enable this to be calculated[33]. The

[31] Killeen IJ (2003). Ecology of Desmoulin's Whorl Snail. Conserving Natura 2000 Rivers Ecology Series No. 6. English Nature, Peterborough.
[32] Jarvie, H. P., Neal, C., & Withers, P. J. (2006). Sewage-effluent phosphorus: a greater risk to river eutrophication than agricultural phosphorus?. *Science of the total environment*, *360*(1-3), 246-253.
[33] Natural England (2019). Advice on Nutrient Neutrality for New Development in the Stour Valley Catchment in Relation to Stodmarsh Designated Sites – For Local Planning Authorities. Natural England.

calculations for Ash NP is included in Appendix C and D. This can be used to show that development either avoids harm to protected sites from water quality issues or will need to provide mitigation required to ensure that there is no adverse effect with respect to nutrients. It will then be for the applicant to ensure that such mitigation is identified before their planning application is submitted.

5.27 At the time of writing Southern Water have confirmed that the Dambridge WwTW does not have an Environmental Permit limit for nitrogen and an average figure for the Stour catchment has been requested. In lieu of the average figure for the Stour Catchment, the average nitrogen figure from the Southern Water Solent catchment has been used of 27mg/l. This figure may change if the average for the Stour catchment becomes available. Using this figure, nutrient calculations for the 223 dwellings allocated within the Ash NP show that this development will, without mitigation, lead to an **increase** in surplus nitrogen of **627.2 kg/N/yr** when compared to the 'no change' in existing land scenario.

5.28 The Environmental Permit limit for phosphorous at the Dambridge WwTW is 2mg/l. using this figure, nutrient calculations for the 223 dwellings allocated in the Ash NP will, without mitigation lead to an **increase** in surplus phosphorous of **53 kg/P/yr** when compared to the 'no change' in existing land scenario. Based on predicted nutrient calculations for nitrogen and phosphorous there will be an increase in nutrient output from the WwTW and nutrient neutrality would not be met in the absence of mitigation.

5.29 As such, according to the Stodmarsh Nutrient Neutrality Methodology the following text was recommended for inclusion in the Neighbourhood Plan Policies ANP7a to ANP7e: **the development will only be supported if it can achieve nutrient neutrality regarding Stodmarsh SAC/SPA/Ramsar site.** This recommended change has now been made to all these policies.

5.30 Assuming the developer's nutrient neutrality calculation confirms that mitigation is required, it is likely that some or all of the following may need to be undertaken. This could be added to the NP as an explanatory note:

5.31 **If mitigation is required, the following should be explored:**

i. **Secured agreement with the wastewater treatment provider that they will maintain an increase in nitrogen/phosphorous removal at the WwTW though this will be unlikely to be successful until after the WINEP study is completed and the measures required to achieve favourable conservation status with regards to treatment works have been agreed.**

ii. **Secured agreement with the wastewater treatment provider or others to provide and maintain an increase in nitrogen/phosphorous offsetting from catchment management measures (this may include mini-farm interceptor wetlands). This must take account of the restoration duties and must not hinder the ability to achieve the conservation objectives.**

iii. **Provide measures that will remove nitrogen/phosphorous draining from the development site or discharged by the WwTW (such as wetland or reedbed).**

iv. **Increase the size of the SANGs and Open Space provision for the development on agricultural land that removes more nitrogen/phosphorous loss from this source.**

v. **Establish changes to agricultural land in the wider landholding in perpetuity that removes more nitrogen/phosphorous loss from this source.**

vi. **Acquire, or support others in acquiring, agricultural land elsewhere within the river catchment area containing the development site (or the waste water treatment discharge if different), changing the land use in perpetuity (e.g. to woodland, heathland, saltmarsh, wetland or conservation grassland) to remove more nitrogen/phosphorous loss from this source and/or, if conditions are suitable, provide measures that will remove nitrogen/phosphorous on drainage pathways from land higher up the catchment (e.g. interception wetland).**

5.32 This has now been added as Appendix 1 of the Neighbourhood Plan. It can therefore be concluded that the Neighbourhood Plan will not adversely affect the integrity of vulnerable European sites with regards to water quality.

Non-physical Disturbance ‘in-combination’

5.33 All sites were screened out from being suitable to be functionally linked land in the screening stage, however, there is the potential that areas outside of but in close proximity to the allocations could be suitable for foraging birds listed as qualifying features within the SPA and Ramsar designations.

5.34 Noise, light and vibration during construction and light during operation of the residential developments could potentially have an impact on foraging birds should they be present in close proximity to the allocations. However, given the urban nature of the allocations e.g. each site is bordered by residential development on two or more boundaries, light from the urban setting is unlikely to be significantly changed or increased through the operation of the new developments.

5.35 With regards to noise and vibration during construction, again due to the urban nature of the allocated sites protocols would be required to protect residential amenity and human health during construction. These protocols will be present within a Construction Environment Management Plan and will ensure that noise and vibration are kept below disturbing levels for neighbouring properties. Therefore, any SPA species potentially on land in close proximity to the allocated sites are also likely to be protected from noise and vibration disturbance by these protocols during the construction of the development. Given the urban nature of the allocations, noise and vibration is unlikely to be significantly changed or increased through the operation of the new developments.

6. Air Quality Assessment

Introduction

6.1 It is considered that the Thanet Coast and Sandwich Bay SPA and Ramsar site and the Sandwich Bay SAC are vulnerable to nitrogen deposition and are located within 200m of a major road, likely to be utilised as a journey to work route. This consists of a single road link, the A256. The modelling was undertaken along three transects within the SPA/SAC adjacent to the road (See Appendix E), with the closest part of the SPA/SAC located 60m from the roadside.

6.2 Road traffic data in the form of 24-hour AADT (Annual Average Daily Traffic) based on 2018 data were provided by the AECOM transport team. Routeplanner was used to identify which destinations would attract trips along the A256, from each point of origin (site allocation). Additional vehicle trips forecast to travel along the A256 were based on residential site allocations within Dover, with employment captured indirectly and trip generation was derived by extracting vehicle trip rates (AM peak, PM peak and weekday 12 hour) from transport reports submitted in support of recent planning applications within the Dover district.

6.3 The traffic modelling data forecast the increase in traffic along the A256 for the Ash Neighbourhood Plan alone to be an additional 609 AADT two-way trips and in-combination with expected growth across Dover (modelled specifically) as well as Thanet, Shepway and Canterbury (captured through adjusted TEMPRO growth factors) an additional 5,706 AADT two-way trips. These results were then used to forecast the resulting air quality impact of the increase in two-way trips along the A256. This was undertaken in lieu of Dover District Council's own traffic and air quality modelling exercise being complete at time of report writing.

6.4 None of the habitats for which Sandwich Bay SAC are designated (sand dunes at various stages of succession) are identified on the Air Pollution Information System as being sensitive to ammonia. Therefore, ammonia is only considered below as a source of nitrogen.

6.5 With regards to NOx the critical level is set at 30ug/m^3. Baseline data was utilised from the year 2018 which recorded NOx concentrations of 21.7ug/m^3 along the North transect at 80m from the roadside (the boundary of the SAC where this transect is located), 22.7ug/m^3 along the Central transect at 85m (the closest part of the SAC) from the roadside and 28.3ug/m^3 along the South transect at 60m from the roadside (the closest part of the SAC). Due to improvements in vehicle emissions technology (as reflected in the Defra Emission Factor Toolkit) NOx concentrations are forecast to continue to fall to 2040 notwithstanding the expected increase in traffic due to development across Dover and Thanet. As both baseline and future concentrations are forecast to be below the Critical Level of 30ug/m^3 it can be concluded that NOx will not have an adverse impact upon the SAC itself and will only be considered further within the assessment as a source of nitrogen deposition.

Assessment 'Alone'

6.6 For nitrogen deposition, an assessment of air quality was undertaken for both alone impacts e.g. the Ash Neighbourhood Plan and in-combination e.g. Ash Neighbourhood Plan in combination with all other growth across Dover, Thanet, Shepway and Canterbury. In this section discussion will focus on the contribution of the Ash Neighbourhood Plan alone.

6.7 The lowest critical load for nitrogen deposition of the designated habitats within the SAC is 8kgN/ha/yr for fixed coastal dunes with herbaceous vegetation or 'grey dunes'. Exceedance of this level can cause an increase in tall grasses, decrease in prostrate plants, increased nitrogen leaching, soil acidification and loss of typical lichen species.

6.8 The baseline data shows the minimum total annual mean nitrogen deposition to the SAC in the vicinity of the road of 15.7kgN/ha/yr along the Central transect at 85m from the roadside. Therefore, all transects are already in exceedance of the Critical Load for nitrogen deposition in the baseline year. However, Paragraph 5.26 of Natural England guidance[34] states that '*An*

[34] http://publications.naturalengland.org.uk/publication/4720542048845824

exceedance alone is insufficient to determine the acceptability (or otherwise) of a project'. Where an exceedance of the critical load is expected, it is also necessary to consider whether the forecast dose will be imperceptible. As per paragraph 4.25 of same guidance '*…1% of critical load/level are considered by Natural England's air quality specialists (and by industry, regulators and other statutory nature conservation bodies) to be suitably precautionary, as any emissions below this level are widely considered to be imperceptible…There can therefore be a high degree of confidence in its application to screen for risks of an effect*'.

6.9 As the deposition rate is already in exceedance of the Critical Level, this assessment therefore first looks at the contribution of the Ash Neighbourhood Plan in terms of a significant increase above the critical level. For this SAC, 1% of the critical load is 0.08kgN/ha/yr.

6.10 In order to assess the contribution of the Ash Neighbourhood Plan alone it is necessary to separate it from the rest of development in the Dover and Thanet Districts. In Appendix E the contribution of the Neighbourhood Plan alone is shown by the difference between DS1 2040 and DS2 2040.

6.11 The South transect is the closest to the SAC at 60m from the roadside and has the highest contribution from the Neighbourhood Plan alone at 0.05kgN/ha/yr. This is below 1% of the critical load (0.08kgN/ha/yr) and therefore it can be concluded that the Ash Neighbourhood Plan will not have an adverse effect upon the European sites alone.

Assessment 'In-Combination'

6.12 The contribution of Ash Neighbourhood Plan, however, must be looked at in-combination with other plans and projects, the principle of which is the Emerging Dover District Local Plan. However, as discussed earlier, changes in flows due to growth in Thanet, Shepway and Canterbury was also captured through use of adjusted TEMPRO growth factors.

6.13 The air quality assessment therefore also assesses the growth across the whole of this area including the Ash Neighbourhood Plan. To assess if in-combination contribution growth would potentially have an adverse effect on the integrity of the European site modelled scenario DS2 2040 is subtracted from scenario DM 2040 in Appendix E.

6.14 Scenario DM 2040 relates to consented development only e.g. consented growth without the surrounding Local Plans or the Ash Neighbourhood Plan. This is the level of deposition which would occur without the further development proposed in those plans. Scenario DS2 2040 takes the DM 2040 traffic flows and adds the further growth proposed within the surrounding Local Plans and the Ash Neighbourhood Plan.

6.15 The difference between DM 2040 and DS2 2040 on the South transect 60m from the roadside is 0.56kgN/ha/yr, which is 7% of the Critical Load. Therefore, when all growth is considered in-combination an adverse effect on the integrity of the European sites cannot be dismissed and will require mitigating.

6.16 As an in-combination effect cannot be dismissed mitigation will be required at a Local Plan level to address the cumulative effects of growth, mainly across Dover District. However, it is clear that Ash Neighbourhood Plan will make an imperceptible contribution (see Assessment 'Alone') and have no appreciable effect on the SAC. It is appropriate for this to be taken into account in determining the mitigation burden for Ash Neighbourhood Plan and the associated planning applications for housing sites. In drawing this conclusion, we are mindful of paragraph 48 of Advocate-General Sharpston's Opinion in European Court of Justice Case C-258/11 where she stated that: '*the requirement for an effect to be 'significant' exists in order to lay down a de minimis threshold. Plans and projects that have no appreciable effect on the site can therefore be excluded. If all plans and projects capable of having any effect whatsoever on the site were to be caught by Article 6(3), activities on or near the site would risk being impossible by reason of legislative overkill*'. While Advocate-General Sharpston's Opinion was in regard to whether every contributor to an 'in combination' effect, no matter how small, actually needs to be subject to Appropriate Assessment in order to be legally compliant, logically it also suggests that minor contributors to an effect should be required to deliver proportionate mitigation.

6.17 Since the Dover District Local Plan traffic and air quality assessment work is ongoing (and will ultimately supersede the modelling discussed in this HRA report) it is not possible or appropriate for the Ash Neighbourhood Plan to devise and set out detailed traffic and air quality mitigation measures. Moreover, the majority of such measures would require strategic organisation such as is only possible from a District or County Council. Since the Neighbourhood Plan must ultimately be in conformity with the Local Plan it is however appropriate for it to include policy wording to support sustainable transport within the parish and ensure that any planning applications that come forward for housing in the parish are in alignment with, and contribute to, any air quality mitigation strategy that may be developed by Dover District Council, before they are consented.

6.18 The original wording of Policy ANP15 said "*Encourage the use of public transport, including new and enhanced pedestrian / cycle routes to the existing network and where necessary, the provision of new bus infrastructure*". **It was recommended that this policy is strengthened to include reference to sustainable transport e.g. "*Encourage the use of sustainable transport such as public transport*…" It was also recommended that a sentence be added to the policy to ensure compliance with any mitigation required with within the overarching Emerging Dover District Local Plan with regards to air quality impacts.**

6.19 This additional policy wording has now been included within Policy ANP15 of the Ash NP. As such, it can be concluded that the Neighbourhood Plan will not adversely affect the integrity of vulnerable European sites with regards to air quality.

7. Conclusions

Recreational Pressure

7.1 Within the HRA Screening Opinion (dated 20 January 2019), Natural England advise "*the Council to revisit the evidence base on recreational disturbance to the Thanet Coast and Sandwich Bay SPA as part of the forthcoming review of their Local Plan to establish whether housing growth in Dover is likely to result in a significant effect on the SPA and therefore whether mitigation measures are required*". This updated review of the mitigation strategy by the District Council during the update of the Local Plan may remove the need for developer contributions, or it may indeed strengthen mitigation measures or increase developer contributions. The Neighbourhood Plan is required to comply with the Local Plan and therefore, **it is recommended that, as the Local Plan and updated mitigation strategy is not currently available, the Neighbourhood Plan should include a policy for the protection of European sites which states compliance with the current and any future mitigation strategy produced by Dover District Council. Suggested wording includes:**

"Planning permission for any development will not be supported unless:

- ***It complies with the most recent Mitigation Strategies relating to Thanet Coast and Sandwich Bay SPA and Sandwich Bay SAC, where applicable; and,***
- ***The development can evidence it will not cause an adverse effect on the integrity of any European site."***

7.2 This recommendation has now been included in Policy ANP1.It can therefore be concluded that the Neighbourhood Plan will not adversely affect the integrity of vulnerable European sites with regards to recreational pressure.

Water Quality

7.3 The nutrient neutrality calculations for the 223 dwellings allocated within the Ash NP have shown that there will be an increase of:

- 53 kg/P/yr in surplus phosphorous when compared to the 'no change' in existing land scenario; and,
- 627.2 kg/N/yr in surplus nitrogen when compared to the 'no change' in existing land scenario.

7.4 As such, according to the Stodmarsh Nutrient Neutrality Methodology the following text is recommended for inclusion in the Neighbourhood Plan Policies ANP7a to ANP7e: **the development will only be supported if it can achieve nutrient neutrality regarding Stodmarsh SAC/SPA/Ramsar site.** This recommended change has now been added to all these policies.

7.5 Assuming the developer's nutrient neutrality calculation confirms that mitigation is required, it is likely that some or all of the following may need to be undertaken. This could be added to the NP as an explanatory note:

7.6 **If mitigation is required, the following should be explored:**

vii. Secured agreement with the wastewater treatment provider that they will maintain an increase in nitrogen/phosphorous removal at the WwTW though this will be unlikely to be successful until after the WINEP study is completed and the measures required to achieve favourable conservation status with regards to treatment works have been agreed.

viii. Secured agreement with the wastewater treatment provider or others to provide and maintain an increase in nitrogen/phosphorous offsetting from catchment management measures (this may include mini-farm interceptor wetlands). This

must take account of the restoration duties and must not hinder the ability to achieve the conservation objectives.

ix. Provide measures that will remove nitrogen/phosphorous draining from the development site or discharged by the WwTW (such as wetland or reedbed).

x. Increase the size of the SANGs and Open Space provision for the development on agricultural land that removes more nitrogen/phosphorous loss from this source.

xi. Establish changes to agricultural land in the wider landholding in perpetuity that removes more nitrogen/phosphorous loss from this source.

xii. Acquire, or support others in acquiring, agricultural land elsewhere within the river catchment area containing the development site (or the waste water treatment discharge if different), changing the land use in perpetuity (e.g. to woodland, heathland, saltmarsh, wetland or conservation grassland) to remove more nitrogen/phosphorous loss from this source and/or, if conditions are suitable, provide measures that will remove nitrogen/phosphorous on drainage pathways from land higher up the catchment (e.g. interception wetland).

7.7 This has now been added as Appendix 1 of the Neighbourhood Plan. It can therefore be concluded that the Neighbourhood Plan will not adversely affect the integrity of vulnerable European sites with regards to water quality.

Non-Physical Disturbance

7.8 All allocated sites were screened out from being suitable for functionally linked land. However, areas outside of the allocations may have potential to support SPA species. with regards to non-physical disturbance, all of the allocation sites are within the urban area and bordered by urban development on between one and three sides of the allocated sites.

7.9 Due to the urban nature of the allocations, operational light noise and vibration is unlikely to significantly change or increase through the operation of the allocated sites.

7.10 During construction again due to the urban nature of the allocated sites protocols would be required to protect residential amenity and human health during construction. These protocols will be present within a Construction Environment Management Plan (CEMP) and will ensure that noise and vibration are kept below disturbing levels for neighbouring properties. Therefore, any SPA species potentially on land in close proximity to the allocated sites are also likely to be protected from noise and vibration disturbance by these protocols during the construction of the development.

7.11 With construction protocols within the CEMP for each allocation site and implemented during the construction program it can be concluded that the Neighbourhood Plan will not adversely affect the integrity of vulnerable European sites with regards to non-physical disturbance.

Air Pollution

7.12 An air quality assessment was undertaken for both alone and in-combination effects of the Ash NP.

7.13 In order to assess the contribution of the Ash Neighbourhood Plan alone it was necessary to separate it from the rest of development in the Dover District. Therefore, when looking at the table in Appendix E the difference between DS1 2040 and DS2 2040 was considered as the Neighbourhood Plans contribution alone.

7.14 The South transect is the closest to the SAC at 60m from the roadside and has the highest alone contribution from the Neighbourhood Plan at 0.05kgN/ha/yr. This is below 1% of the critical load (0.08kgN/ha/yr) and therefore, it can be concluded that the Ash Neighbourhood Plan will not have an adverse effect upon the European sites alone.

7.15 The air quality assessment also assessed the growth across the whole of the Dover District which included the Ash Neighbourhood Plan – the ‘in-combination’ contribution. To assess if the in-

combination contribution of growth within the Dover District including the Ash Neighbourhood Plan would have an adverse impact on the integrity of the European site DS2 2040 was subtracted from DM 2040 in the table in Appendix E.

7.16 The difference between DM 2040 and DS2 2040 on the South transect 60m from the roadside is 0.56kgN/ha/yr which is 7% of the Critical Load. Therefore, when all growth is considered in-combination an adverse effect on the integrity of the European sites cannot be dismissed and will require mitigating.

7.17 As an in-combination effect cannot be dismissed mitigation will be required at a Local Plan level to address the cumulative effects of growth, mainly across Dover District. However, it is clear that Ash Neighbourhood Plan will make an imperceptible contribution (see Assessment 'Alone') and have no appreciable effect on the SAC. It is appropriate for this to be taken into account in determining the mitigation burden for Ash Neighbourhood Plan and the associated planning applications for housing sites.

7.18 Since the Dover District Local Plan traffic and air quality assessment work is ongoing (and will ultimately supersede the modelling discussed in this HRA report) it is not possible or appropriate for the Ash Neighbourhood Plan to devise and set out detailed traffic and air quality mitigation measures. Moreover, the majority of such measures would require strategic organisation such as is only possible from a District or County Council. Since the Neighbourhood Plan must ultimately be in conformity with the Local Plan it is however appropriate for it to include policy wording to support sustainable transport within the parish and ensure that any planning applications that come forward for housing in the parish are in alignment with, and contribute to, any air quality mitigation strategy that may be developed by Dover District Council, before they are consented.

7.19 Policy ANP15 currently says "*Encourage the use of public transport, including new and enhanced pedestrian / cycle routes to the existing network and where necessary, the provision of new bus infrastructure*". **It is recommended that this policy is strengthened to include reference to sustainable transport e.g. "*Encourage the use of sustainable transport such as public transport*…" It is also recommended that a sentence is added to the policy to ensure compliance with any mitigation required with within the overarching Emerging Dover District Local Plan with regards to air quality impacts.**

7.20 This additional policy wording has now been included within Policy ANP15 of the Ash NP. As such, it can be concluded that the Neighbourhood Plan will not adversely affect the integrity of vulnerable European sites with regards to air quality.

Appendix A Policy Screening Table

Policy Number	Policy Description	Test of Likely Significant Effect
Policy ANP1 – Development in the Countryside	Development in the countryside beyond the village settlement boundary will only be permitted where: 1.1 Development provides for a local business or community need on a site that is adjacent to or beyond the existing village settlement area and is physically well related to the existing settlement boundaries, The use of previously developed land and sites that are physically well connected to the existing village settlement will be encouraged where suitable opportunities exist. 1.2 All development works should review the possibilities of archaeological finds within the site confines and seek early discussions with the Kent County Council Heritage Conservation team. 1.3 There is regard to the purposes of conserving and improving the physical surroundings and the natural beauty by enhancing and expanding the trees and hedgerows, preferably native / indigenous, and landscape within the designated area; 1.4 It would not have an adverse impact on the landscape setting of Ash including the Conservation Areas (Map 6); 1.5 It would maintain the distinctive views and visual connectivity of the village with the surrounding countryside from public vantage points within, and adjacent to, the built-up area, in particular those defined on Map 7 Key views; 1.6 It would protect and enhance the following features: - Biodiversity of the Parish: by improving habitats for rare species of flora and fauna and by identifying and pursuing opportunities for securing measurable net gains for biodiversity as set out by DEFFA metric to enable improvements to be measured and as required by the NPPF 2019. 1.7 In areas where there would be significant effect on Public Rights of Way, the network must also be included in the landscape planning of the infra-structure as a whole. Nature Conservation 1.8 Developments should respect the natural environment within the designated site and adjacent land by enhancing and re-connecting the existing natural features such as veteran trees, hedges, protecting wildlife corridors/ watercourses. 1.9 Where necessary and appropriate, proposed development should demonstrate that the conservation of protected species will be maintained, including that of their foraging habitat	No Likely Significant Effect This policy is a development management policy, which lists conditions for development to which the developers must comply. The policy also provides protection to protected species and their foraging habitats.

Policy Number	Policy Description	Test of Likely Significant Effect
	1.10 Where necessary and appropriate, development should incorporate additional features for the support of protected species, such as bird and bat boxes, swift bricks and roosting sites and access routes for wildlife (e.g. hedgehogs). 1.11 Lighting should only be directed where necessary and there should be no loss of night-time dark skies due to light pollution. 1.12 Development will only be supported if it complies with the most recent Mitigation strategies relating to Thanet Coast and Sandwich Bay SPA and Sandwich Bay SAC, where applicable; and 1.13 The development can evidence it will not cause an adverse effect on the integrity of any European Site in the proximity of the parish.	
Policy ANP2 – Designated local green and open space	2.1 Development proposals that result in the loss of green spaces or result in any harm to their character, setting, accessibility, appearance, or general quality or amenity value will not be supported. 2.2 The provision of high-quality, open green spaces and opportunities for outdoor recreation space and / or access to these via green routes should be a priority of all developments. 2.3 The areas listed below are designated as publicly accessible Green Spaces and subject to this policy. (They are shown on Map 5 Areas of green spaces and their designation is shown in Table 1 Designation of the spaces). 1 Saunders Wood 2 Collar Makers Green 3 Public Bridleway EE466 4 Street Field (also DDC 2010 Designated) and Discovery Field 5 Ash War Memorial 6 St Nicholas Churchyard (also DDC 2010 Designated) 7 Ash Recreation Ground (also DDC 2010 Designated) 8 Allotments (also DDC 2010 Designated) 9 10 Acre Field / The Meadows 10 Ash Bowls Club (also DDC 2010 Designated) 11 School Grounds (Cartwright and Kelsey (CoE Primary School) (also DDC 2010 Designated) 12 School Grounds (St Faiths at Ash Prep School) (also DDC 2010 Designated) 13 Pound Corner 14 Green Corridors 2.4 The exception would be when there are no other available sites within the parish for a building that would bring considerable benefits to the community, such as a doctors' surgery, care home etc., and where alternative sites of equal size and quality are provided prior to commencement of development.	No Likely Significant Effect This policy is a development management policy which lists conditions for which the developers must comply. The policy protects local green space.

Policy Number	Policy Description	Test of Likely Significant Effect
Policy ANP3 – Green and open space in new developments	Developments of 5 or more dwellings should provide green and open spaces for residents' health and well-being and recreational use. And: 3.1 Provide high quality, open green spaces and opportunities for recreational space and / or access to these via green routes, as a priority of all developments, and developers should refer to the KCC ROWIP, PRoW's and "Access Good Design Guidance"; and 3.2 Provide green infrastructure linking new developments to existing corridors and provide access by foot or cycle to and around the village and public amenities; and 3.3 Should be sensitive to the rural setting, relate to the existing landscape and enhance the built environment.	No Likely Significant Effect This policy is a development management policy which lists conditions by which the developer must comply. This policy promotes onsite green space provision within developments of 40 or more dwellings and protects existing green corridors.
Policy ANP4 – Biodiversity	4.1 Developments should provide biodiversity net gains of not less than 10% at all stages of the mitigation processes, as set out in the best practice guidance produced by CIRIA (Construction Industry Research and Information Association), CIEEM (Chartered Institute of Ecology and Environmental Management) and IEMA (The Institute of Environmental Management and Assessment) and the Government's 25 year 'Environmental Plan 2018', Kent Nature Partnership's 'Kent Biodiversity 2020 and beyond – a strategy for the natural environment 2015-2025' or subsequent publications. Developers must demonstrate that they have followed the mitigation hierarchy. 4.2 New developments present an opportunity to maximise the benefits for Biodiversity and should therefore seek to maximise these while ensuring there is no detriment to the Sandwich Bay and Thanet Coast SPA, SAC and Ramsar sites, Pegwell Bay NNR and Stodmarsh SSSI. 4.3 Developments should seek to avoid any harm and to minimise any adverse impact upon, the local biodiversity, habitats and wildlife. Compensatory provision elsewhere should be the last resort and used only if the development demonstrates an overriding benefit to the local community. 4.4 Where necessary and appropriate, development should incorporate additional features for the support of protected species, such as bird and bat boxes, swift bricks and roosting sites and access routes for wildlife (e.g. hedgehogs). 4.5 Developments will only be supported when they provide an independent survey report that is supported by the local planning authority, which agrees a robust mitigation plan that identifies there are no alternatives, or that appropriate mitigation measures can be put into place 4.6 The local authority must meet the requirements of the Natural Environment and Rural Communities Act 2006, sections 40 and 41, in relation to the mitigation plan. 4.7 The development will only be supported if it complies with the most recent Mitigation strategies relating to Thanet Coast and Sandwich Bay SPA and Sandwich Bay SAC, where applicable; and.	No Likely Significant Effect This policy is a development management policy which lists conditions by which the developer must comply. This policy promotes a minimum of 10% biodiversity net gain and requires a robust mitigation plan for each development.

Policy Number	Policy Description	Test of Likely Significant Effect
	4.8 The development can evidence it will not cause an adverse effect on the integrity of any European Site within the proximity of the parish.	
Policy ANP5 – Climate Change	5.1 New developments will be expected, subject to viability, to: a) be designed to minimise vulnerability to the range of impacts arising from climate change by maximising energy efficiency, utilising low carbon energy and reduce greenhouse emissions; b) be required to be resilient to climate change and demonstrate how the development will respond to climate change adaption measures; c) incorporate one or more low carbon technologies; d) not increase, and where possible, to reduce surface water run-off through increased permeability of surfaces and the use of Sustainable Drainage Systems; e) incorporate, where appropriate, bio-diverse green roofs and green walls; f) provide public or private open space that is accessible to shade and shelter and is multi-functional; g) provide opportunities to encourage local food sources, recycling and composting; h) be encouraged to use the Home Quality Mark and Passivhaus design standards; i) provide electric vehicle car charging points; and j) provide good quality pedestrian / cycle infrastructure 5.2 New developments should reduce greenhouse gas emissions by the use of renewable and low carbon energy and heat by reflecting the government's policy for national technical standards. 5.3 New developments should submit a positive strategy as part of the planning application, demonstrating how the development will achieve carbon sequestration. It will also demonstrate how low energy consumption will be achieved based upon low carbon technologies (e.g. air/ground source heat pumps, photovoltaic panels, solar water heating, rainwater harvesting etc). If a positive strategy cannot be achieved then a statement outlining the justification why it cannot be achieved will be required. 5.4 The development will only be supported if it complies with the most recent Mitigation strategies relating to Thanet Coast and Sandwich Bay SPA and Sandwich Bay SAC, where applicable; and. 5.5 The development can evidence it will not cause an adverse effect on the integrity of any European Site within the proximity of the parish.	No Likely Significant Effect This policy is a development management policy which lists conditions by which the developer must comply. This policy requires developments to be resilient to climate change.
Policy ANP6 – Developments and conservation	Development proposals that deliver social and environmental aims of the plan will be supported. Particular support will be given to proposals that would: 6.1 Maintain the key views as shown on Map 7 Key Views	No Likely Significant Effects

Policy Number	Policy Description	Test of Likely Significant Effect
	6.2 Demonstrate a high standard of design and are built to a minimum of Code for Sustainable Homes (2006), Level 5 standards, which respects and reinforces the local distinctiveness of its location, surroundings and the individual character areas of the Parish. (Refer to the Ash Character Assessment) 6.3 Building design should respect and respond to the village setting (refer to the Ash Design Guide) in relation to: a) Scale, density, massing, height of nearby buildings, orientation, use of local natural materials, fenestration, landscape layout and access; and b) The scale, design and materials of the street furniture in the public realm (highways, footways, open spaces and landscape). 6.4. Buildings should take account of landform, layout, building orientation, massing and landscape to minimise energy consumption. 6.5 All new developments or dwellings should be designed to avoid increased vulnerability to the range of impacts arising from climate change by: a) Ensuring developments' schemes demonstrate how adaption measures and sustainable development principles have been incorporated into the design and proposed implementation; b) Planning applications which use the Home Quality Mark and Passivhaus design standards will be positively supported; c) Conversions and extensions of 500 sqm of residential floor space or above, or five or more dwellings, to achieve 'excellent' in BREEAM domestic refurbishment; and d) Expect non-domestic developments over 500 sqm of floor space or above, to achieve 'excellent' in BREEAM assessments and encouraging zero carbon in new developments from 2021. 6.6 All new developments must provide facilities for cycle storage and in the case of dwellings for the disabled, buggy storage. 6.7 New developments should demonstrate how they will positively accommodate, divert or enhance paths and link networks. 6.8 There should be provision for electric charging to either each dwelling or 1 per 5 dwellings, as long as it is within 100 m and has a dedicated charging bay. 6.9 It respects, protects and enhances the settings of Listed Buildings and street frontages as described in the Ash Character Assessment. 6.10 Respects the integrity, character and appearance of the conservation areas and Character Assessment areas for Ash. 6.11 Protect and sensitively incorporate landscape features such as trees, hedges and green spaces on the site; and is well integrated into the surrounding landscape.	This policy is a development management policy which lists conditions by which the developer must comply. The policy requires developments to conform to the local character of the village and respect listed buildings.

Policy Number	Policy Description	Test of Likely Significant Effect
	6.12 In areas where there would be significant effect on Public Rights of Way, the network must also be included in the landscape planning of the infra-structure as a whole. 6.13 All development works should review the possibilities of archaeological finds within the site confines and seek early discussions with the KCC Heritage Conservation team.	
Policy ANP7a – Agri/Cowans land bought forward from DDC 2015 Land Allocation	This land is allocated for residential development with an estimated capacity of 95 dwellings. Planning permission will be permitted provided that: 7a.1 Any application for development is preceded by and is consistent with a development brief that has been agreed by Dover District Council; this must include an ecological survey. 7a.2 There is a comprehensive approach to development of the whole site but if the site is developed incrementally, each phase must demonstrate that it will not prejudice the implementation of the whole development; 7a.3 The impact of the development on the setting of the village and wider landscape is minimised by reference to policies ANP4, ANP5 and ANP6; 7a.4 The existing boundary hedgerows and vegetation are retained and enhanced as part of the development; 7a.5 Vehicular access is located from Sandwich Road and New Street; 7a.6 There is no vehicular access installed from Cherry Garden Lane; 7a.7 There should be provision for charging electric vehicles within each dwelling or a minimum of 1 community charging point for each five dwellings, as long as it is within 100 metres and has a dedicated charging bay; 7a.8 Open and/or shared spaces should be maintained by a management company established by the developer with on-going maintenance responsibilities being held by this company; 7a.9 Development should ensure occupation is phased to align with the delivery of sewage infrastructure, provide a connection to sewage and water and gas at the nearest point of adequate capacities, and ensure future access to existing water supply and / or wastewater infrastructure for maintenance and up sizing purposes; and 7a.10 A mitigation strategy to address any impact on the Thanet Coast and Sandwich Bay Ramsar and SA sites and Sandwich Bay SAC site is developed. The strategy should consider a range of measures and incentives 7a.11 The development will only be supported if it can achieve nutrient neutrality regarding the Stodmarsh SAC/SPA/Ramsar site.	Potential Likely Significant Effects This policy allocates 95 residential dwellings within the Ash Parish. Therefore, the development provided via this policy has the potential to impact European sites either alone or in combination through the following impact pathways: • Water Quality • Recreational Pressure • Air Pollution Note that this initial analysis does not take account of the subsequent introduction of requirements 7a.10 and 7a.11 to protect European sites, or other policy changes in response to recommendations in this HRA. The presence of that wording is taken into account in the main text of the report.

Policy Number	Policy Description	Test of Likely Significant Effect
Policy ANP7b – Old Council Yard, land allocated from DDC 2015 Land Allocation	This land is allocated for residential development with an estimated capacity of 5 dwellings and would be suitable for specialist housing. Planning permission will be permitted provided that: 7b.1 Any application of development is preceded with a development brief for the whole site including the retention and/or replacement of the Scout Hut that has been agreed by Dover District Council; 7b.2 The impact of development on the setting within the village and wider landscape is minimised and by reference to policies ANP4, ANP5 and ANP6; 7b.3 Vehicular access is via Molland Lea; 7b.4 There should be provision for electric vehicle charging to either each dwelling or 1 per five dwellings, as long as it is within 100 metres and has a dedicated charging 7b.5 The development will only be supported if it can achieve nutrient neutrality regarding Stodmarsh SAC/SPA/Ramsar site.	Potential Likely Significant Effects This policy allocates 5 residential dwellings within the Ash Parish. Therefore, the development provided via this policy has the potential to impact European sites either alone or in combination through the following impact pathways: • Water Quality • Recreational Pressure • Air Pollution Note that this initial analysis does not take account of the subsequent introduction of requirement 7b.5 to protect European sites, or other policy changes in response to recommendations in this HRA. The presence of that wording is taken into account in the main text of the report.
Policy ANP7c – HELAA 45 Land South of Mill Field	Site area 0.4 ha. The land is allocated for residential development with an estimated capacity of 9 dwellings. Planning permission will be permitted provided that: 7c.1 The existing boundary hedgerows and veteran trees are retained and enhanced with native / indigenous species as part of the development boundary; new hedgerows of no less than 10 metres width should be established along the southwest and east boundaries; 7c.2 A green buffer zone is to be provided between the development and the existing houses to the north side of the site. (This could be grass with some native trees spread along the kerb-edge to provide shelter in summer. The trees should be of a type that do not grow taller than 5-6 metres. This area could contain the electric vehicle charging point); 7c.3 There should be provision for charging electric vehicles within each dwelling or a minimum of 1 community charging point for each five dwellings, as long as it is within 100 metres and has a dedicated charging bay; 7c.4 The main vehicular access will be via the existing road through Millfield; 7c.5 The impact of development on the setting and the surrounding dwellings and the wider landscape is minimised by reference to policies ANP4, ANP5 and ANP6; 7c.6 The development will only be supported if it can achieve nutrient neutrality regarding the Stodmarsh SAC/SPA/Ramsar site.	Potential Likely Significant Effects This policy allocates 12 residential dwellings within the Ash Parish. Therefore, the development provided via this policy has the potential to impact European sites either alone or in combination through the following impact pathways: • Water Quality • Recreational Pressure • Air Pollution Note that this initial analysis does not take account of the subsequent introduction of requirement 7c.5 to protect European sites, or other policy changes in response to recommendations in this HRA. The presence of that wording is taken into account in the main text of the report.
Policy ANP7d – HELAA 95 Land North of Molland Lane	Site area 3.8 ha an approximate capacity of 105 dwellings Planning :permission will be permitted providing that:	Potential Likely Significant Effects

Policy Number	Policy Description	Test of Likely Significant Effect
	7d.1 The existing boundary of trees and hedgerows, along the A257 are retained and enhanced landscaping, of no less than 15m in width to reduce the impact of noise and air pollution from the A257. New boundaries of native trees and indigenous hedgerow of no less than 10 m in width are established along the southern and western boundaries to reduce the impact of noise, air pollution and visual impact to maintain the rural setting. 7d.2 The density of development along the western boundary is reduced to mitigate the loss of the rural landscape; 7d.3 The Public Rights of Way EE90A, EE112 and the Public Bridleway EE464 are enhanced and incorporated into the design and the layout to improve cycle and pedestrian connections to Chequer Lane (through the new development) and Molland Lea; 7d.4 The main vehicle access could be from Chequer Lane development and / or in the vicinity of Molland Lane; 7d.5 The impact of development on the setting of the village, surrounding dwellings and the wider landscape is minimised through design, materials, setting, massing and scale of new buildings; and is minimised by reference to policies ANP4, ANP5 and ANP6; 7d.6 There should be provision for charging electric vehicles within each dwelling or a minimum of 1 community charging point for each five dwellings, as long as it is within 100 metres and has a dedicated charging bay; 7d.7 Development should ensure occupation is phased to align with the delivery of sewage infrastructure; 7d.8 A mitigation strategy to address any impact on the Thanet Coast and Sandwich Bay Ramsar and SPA sites and Sandwich Bay SAC site is developed. The strategy should consider a range of measures and initiatives. 7d.9 The development will only be supported if it can achieve nutrient neutrality regarding the Stodmarsh SAC/SPA/Ramsar site.	This policy allocates 105 residential dwellings within the Ash Parish. Therefore, the development provided via this policy has the potential to impact European sites either alone or in combination through the following impact pathways: • Water Quality • Recreational Pressure • Air Pollution Note that this initial analysis does not take account of the subsequent introduction of requirements 7d.8 and 7d.9 to protect European sites, or other policy changes in response to recommendations in this HRA. The presence of that wording is taken into account in the main text of the report.
Policy ANP7e – HELAA 163 Land South of Guilton	Site area 0.5 ha. Brownfield site. The land is allocated for residential development with an estimated capacity of 9 dwellings. Planning permission will be permitted provided that: 7e.1 The existing boundary hedgerows and veteran trees are retained and new landscaping to the boundary of no less than 5 metres in width containing indigenous hedges and native trees is established along the south eastern, north and north western boundaries to reflect the importance of the local landscape and its setting within the wider countryside;	Potential Likely Significant Effects This policy allocates 9 residential dwellings within the Ash Parish. Therefore, the development provided via this policy has the potential to impact European sites either alone or in combination through the following impact pathways: • Water Quality • Recreational Pressure • Air Pollution

Policy Number	Policy Description	Test of Likely Significant Effect
	7e.2 Special attention should be paid to sustainable drainage on the site especially near the entrance of the site to avoid the possibility of surface water runoff impacting the residents and the bottom of Guilton Hill and the surrounding road network. 7e.3 The density of development respects its location within the countryside and reflects the special character of the surrounding buildings on the edge of the Guilton Conservation area and one of the main entrances into Ash village; 7e.4 The vehicular access to the site will be from Guilton (road); 7e.5 Pedestrian access to and from the site must allow direct access to a public pavement to both sides of the road at a convenient point; 7e.6 There should be provision for charging electric vehicles within each dwelling or a minimum of 1 community charging point for each five dwellings, as long as it is within 100 metres and has a dedicated charging bay. 7e.7 The development will only be supported if it can achieve nutrient neutrality regarding the Stodmarsh SAC/SPA/Ramsar site.	Note that this initial analysis does not take account of the subsequent introduction of requirement 7e.7 to protect European sites, or other policy changes in response to recommendations in this HRA. The presence of that wording is taken into account in the main text of the report.
Policy ANP8 – Retention of Community Facilities	8.1 Development resulting in the loss, or reduction of scope of community facilities as listed above and shown on Map 17 will only be permitted where it can be demonstrated that demand within the locality for the facility no longer exists or that suitable alternative provision is made elsewhere. 8.2 The current facilities are heavily used and require improvement to accommodate additional growth from developments to ensure there are activities for all ages and to retain and strengthen the community social spirit of the parish that is key to why people want to live there. Contributions from Section 106 agreements will be sought to improve existing community facilities and provide new facilities where there is evidence that the demand placed upon them from development will create deficiencies in their provision. 8.3 Improvements to community facilities should take into account the opportunities to reduce the carbon footprint by incorporating low carbon technologies as part of any improvements.	No Likely Significant Effects This is a development management policy which lists conditions by which the developer must comply. This policy is about protecting and improving community facilities.
Policy ANP9 – Health and Social Care	9.1 The use of the land to the north-west of the GP practice to provide additional accommodation for the expansion of facilities will be supported, as long as the following are addressed: 9.1.1 Developers would be required to agree with Dover District Council and Canterbury Clinical Commissioning Group a Section 106 contribution towards the expansion of the facilities 9.1.2 Provide an appropriate level of parking for staff and visitors 9.1.3 Provide landscaping and screening of the new development.	No Likely Significant Effects This is a development management policy which lists conditions by which the developer must comply. This policy is about improving health care in the parish

Policy Number	Policy Description	Test of Likely Significant Effect
Policy ANP10 – Village Shops and Public Houses	The continued provision, upgrading and extension of village shops, restaurants / cafes and public houses in the parish will be supported subject to: 10.1 Proposals for alternative use will only be permitted, where it has been demonstrated that the current use is no longer economically viable, and that there is no longer any realistic prospect of continued use, by: 10.1.1 Proving the site is being actively marketed for a minimum of 6 months at a realistic price for its current use; and 10.1.2 Showing the facility is no longer economically viable.	No Likely Significant Effects This is a development management policy which lists conditions by which the developer must comply. This policy protects village shops and public houses
Policy ANP11 – Conversion of Rural Buildings to Business Use, Tourist Accommodation and Tourist Attractions	Proposals to convert rural buildings to business use and tourist accommodation or attractions will be supported provided: 11.1 Any changes to existing buildings should retain the traditional rural character of the buildings and their setting in the defined Character Assessment area, and their landscape; 11.2 The building does not require complete or substantial reconstruction; 11.3 The building is of a permanent and substantial construction; 11.4 The amenities of any neighbouring residential occupiers or the tranquillity of the countryside would not be significantly adversely affected; 11.5 The rural road network serving the proposal would be able to accommodate the type and/or amount of traffic that would be generated; and 11.6 Sufficient on-site parking would be provided for staff and delivery vehicles. 11.7 Where possible and practical, the Public Rights of Way network around each of the proposed developments should be improved for access to walking and cycling routes.	No Likely Significant Effects This is a development management policy which lists conditions by which the developer must comply. This policy protects rural buildings, rural road networks and public rights of way where buildings are to be converted to other uses.
Policy ANP12 – Working from Home	12.1 Where there is individual use by the resident of the property to work from home, insofar as planning permission is required, development proposals will be supported for office and / or light industrial use provided that: 12.1.1 No significant and adverse impact arises to nearby residents or properties from noise, fumes, odour or other nuisance associated with the work or activity, or causes traffic issue; and 12.1.2 Any extension or free standing building shall be designed having regard to policies in this plan and should not detract from the quality and character of the building to which they are subservient by reason of height, scale, massing, location or facing materials used in their construction; and 12.1.3 There are good, sustainable transport links with high quality walking and cycling infrastructure available in the development linking to networks outside of the development.	No Likely Significant Effects This is a development management policy which lists conditions by which the developer must comply. This policy protects residents amenity where propertied are extended/converted for purposes of small at home businesses.

Policy Number	Policy Description	Test of Likely Significant Effect
	12.2 Development will be permitted for a community and business centre within the parish that provides, extends and/or re-uses existing community premises subject to: 12.2.1 Provision of sufficient car parking on-site to accommodate the demand; and 12.2.2 The activities within the premises do not impact on the amenity of local residents.	
Policy ANP13 – Off-Street Parking	Proposals for new developments should: 13.1 Provide the KCC Standard and no less than: - 1.5 parking spaces independently accessible per 1 and 2 bedroom dwellings; - 2 parking spaces independently accessible for 3 bedroom dwelling; - 2 parking spaces independently accessible for 4 bed; - 1 parking space independently accessible per specialist dwelling; or - a communal car park. The above excludes garages. 13.2 Not result in the loss of on-site parking space; and 13.3 Not result in the loss of off-road public parking space through the need for cross over and / or visibility splays: and 13.4 Not result in over-spill parking on to public areas.	No Likely Significant Effects This is a development management policy which lists conditions by which the developer must comply. This policy sets out the required level of parking per dwelling to comply with Kent County Council Standards.
Policy ANP14 – Communications	14.1 All new and refurbished residential units and employment developments within the Ash village settlement boundary will enable Fibre to the Premises (FTTP). 14.2 Before development commences, details shall be submitted (or as part of reserved matters) for the installation of fixed telecommunication infrastructure, either by connections to multi-point destinations or buildings including residential, commercial and community have been ducted to accommodate such technologies. 14.3 This shall provide sufficient capacity, including duct sizing to cater for all future phases of the development with sufficient flexibility to meet the need of existing and future residents. 14.4 Where the above is not considered possible or practicable, detailed reasons why and mitigation is to be provided to ensure premises receive the broadband speeds. This should be submitted as part of the planning application or reserved matters. 14.5 Rural conversions should make provision for ducting within the premises to enable line of sight equipment to be installed and accessible in suitable locations within the premises to suit end usage. 14.6 Positively support the requirement for masts in the rural setting to enable connectivity providing that they are not close to:	No Likely Significant Effects This is a development management policy which lists conditions by which the developer must comply. The policy regards ensuring good communications equipment are installed within and close to developments.

Policy Number	Policy Description	Test of Likely Significant Effect
	14.6.1 residential buildings; 14.6.2 historic buildings and conservation areas; 14.6.3 key views; and 14.6.4 sensitive habitats; 14.7 Where possible providers must share masts. 14.8 Positively support connectivity through sight of line links.	
Policy ANP15 – Transport	Development proposals should include measures to minimise and make acceptable the impact on the local road network by: 15.1 Demonstrate how walking and cycling opportunities have been prioritised and new connections have been made to existing routes. 15.2 Encourage the use of sustainable transport, such as public transport, and including new and enhanced pedestrian / cycle routes within the development leading to the existing public transport network and, where necessary, the provision of new bus infrastructure. 15.3 Requiring as part of the planning permission that any development over 10 dwellings along Sandwich Road (from the A257 to Cherry Garden Lane), an agreement between the developer and KCC should be reached to reduce the speed limit from the A257 to Cherry Garden Lane to 30mph and on funding the works associated with this reduction in speed. 15.4 Requiring compliance with any mitigation required within the overarching Emerging Dover District Local Plan with regards to air quality impacts. 15.5 Proposals that either adversely affect existing walking and cycle routes or fail to encourage appropriate new walking and cycling opportunities, will not be supported.	No Likely Significant Effects This is a development management policy which lists conditions by which the developer must comply.
Policy ANP16 – Infrastructure	1.1 New and improved utility infrastructure will be encouraged and supported in order to meet the identified needs of the community, subject to other policies in this plan. 1.2 All new developments will be expected to provide an appropriate level of infrastructure to meet the needs and demands arising from the development. Where an infrastructure need is identified for a particular development, the necessary infrastructure must be put in place to support that development as the needs arises.	No Likely Significant Effects This is a development management policy which lists conditions by which the developer must comply. The policy regards appropriate provision of utility infrastructure within developments.

Appendix B Designated Sites Background

Thanet Coast and Sandwich Bay SPA and Ramsar

Introduction

The Thanet Coast has the longest continuous stretch of coastal chalk in Britain (23 km), representing about 20% of UK coastal chalk and 12% of the coastal exposure in Europe. The chalk cliff face, cave and tunnel habitats and communities here are very uncommon in Europe and therefore important internationally. The intertidal reef, together with the mudflats and sandflats which characterise the remainder of the coastline in North East Kent, provide valuable feeding grounds and roosting areas at low water for wintering waders, Golden Plover *Pluvialis apricaria* and Turnstone *Arenaria interpres* and a breeding population of Little Tern *Sterna albifrons*. Sandwich Bay qualifies as a SAC for its fixed dunes with herbaceous vegetation (grey dunes), embryonic shifting dunes, shifting dunes with *Ammophila arenaria* marram grass (white dunes) and dunes with creeping willow *Salix arenaria* as listed under Annex I of the EU Habitats Directive.

Conservation Objectives

With regard to the SPA[35] 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

With regards to the SPA[36]:

Article 4.1 Qualification – During the breeding season the area regularly supports:

- Little Tern *Sterna albifrons* (Eastern Atlantic - breeding) – 0.3% of the GB breeding population (5 year mean 1992-1996)

Over Winter the area regularly supports:

- European Golden Plover *Pluvialis apricaria* (North-western Europe – breeding) – 0.2% of the GB population (5 year peak mean 1991/92 – 1995/96)

Article 4.2 Qualification – Over winter the area regularly supports:

- Turnstone *Arenaria interpres* (Western Palearctic – wintering) – 1.4% of the population 5 year peak mean 1991/92 – 1995-96

With regards to the Ramsar[37]:

Criterion 2

- Supports 15 British Red Data Book wetland invertebrates

Criterion 6

Qualifying species/populations – Species with peak counts in winter

[35] http://publications.naturalengland.org.uk/publication/6009926887407616
[36] https://jncc.gov.uk/jncc-assets/SPA-N2K/UK9012071.pdf
[37] https://jncc.gov.uk/jncc-assets/RIS/UK11070.pdf

- Turnstone *Arenaria interpres* – 1,007 individuals, representing an average of 1% of the population (5 year peak mean 1998/99 – 2002/03)

Key Vulnerabilities (North East Kent)[38]

- Changes in species distribution
- Invasive species
- Public access/ disturbance
- Hydrological changes
- Air pollution
- Water pollution
- Fisheries: commercial, marine and estuarine

Stodmarsh SPA and Ramsar

Introduction

Stodmarsh SPA is a wetland comprising open water bodies, reedbeds, grazing marshes and alder-carr. The site provides wintering and breeding habitats for important assemblages of wetland bird species, particularly wildfowl and waders. It regularly supports nationally important over-wintering populations of bittern and hen harrier. It supports over 1% of the national breeding population of gadwall, bearded tit and shoveler. It regularly supports a diverse assemblage of breeding birds including great crested grebe, lapwing, redshank, snipe, grasshopper warbler, savi's warbler, sedge warbler and reed warbler. It also regularly supports a diverse assemblage of over-wintering birds including white-fronted goose, wigeon, mallard, pochard, tufted duck, water rail, lapwing and snipe.

Conservation Objectives

With regard to the SPA[39] 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

With regards to the SPA[40]:

Article 4.1 Qualification – Over winter the area regularly supports:

- Botaurus stellaris (Europe – breeding) – 4% of the GB population (5 year peak count 1987/88 – 1991/92)
- Circus cyaneus – 1.2% of the GB population (5 year peak count 1987/88 – 1991/92

Article 4.2 Qualification – During the breeding season the area regularly supports:

- Anas strepera (North-western Europe) – 0.8% of the population in Great Britain (5 year mean 1988-1992)

Over winter the area regularly supports:

- Anas clypeata (North-western/Central Europe) – 1.9% of the population in Great Britain (5 year peak mean 1992/92 – 1995/96)

[38] http://publications.naturalengland.org.uk/publication/6259686785417216
[39] http://publications.naturalengland.org.uk/publication/6543516511502336
[40] https://jncc.gov.uk/jncc-assets/SPA-N2K/UK9012121.pdf

- Anas strepera (North-western Europe) – 1.8% of the population in Great Britain (5 year peak mean 1991/92 – 1995/96)

An internationally important assemblage of birds.
With regards to the Ramsar[41]:
Criterion 2
Six British Red Data Book wetland invertebrates. Two nationally rare plants, and five nationally scarce species. A diverse assemblage of rare wetland birds.
Criterion 6
This site regularly supports nationally important numbers of:

- Gadwall *Anas strepera* (6 pairs)
- Bearded tit *Panurus biarmicus* (42 pairs)

Key Vulnerabilities[42]

- Water pollution
- Invasive species
- Inappropriate scrub control
- Air pollution: impact of atmospheric nitrogen deposition

Stodmarsh SAC

Introduction

Stodmarsh SAC supports the UKBAP species Desmoulin's whorl snail *Vertigo moulinsiana* which occurs within the site on emergent vegetation in fen areas and along ditches in the grazing marsh.
Conservation Objectives
With regard to the SAC[43] 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 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 the qualifying species, and,
- The distribution of the qualifying species within the site.

Qualifying Features

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

- Desmoulin's whorl snail *Vertigo moulinsiana*

Key Vulnerabilities[44]

- Water pollution
- Invasive species
- Inappropriate scrub control
- Air pollution: impact of atmospheric nitrogen deposition

[41] http://archive.jncc.gov.uk/pdf/RISold/7UK069.pdf
[42] http://publications.naturalengland.org.uk/publication/5749196032311296
[43] http://publications.naturalengland.org.uk/publication/5199409650335744
[44] http://publications.naturalengland.org.uk/publication/5749196032311296

Sandwich Bay SAC

Introduction

Sandwich Bay qualifies as a SAC for its fixed dunes with herbaceous vegetation (grey dunes), embryonic shifting dunes, shifting dunes with *Ammophila arenaria* marram grass (white dunes) and dunes with creeping willow *Salix arenaria* as listed under Annex I of the EU Habitats Directive.

Conservation Objectives

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
- The structure and function (including typical species) of qualifying natural habitats, and
- The supporting processes on which qualifying natural habitats rely

Qualifying Features

Annex I habitats[45] that are a primary reason for selection of this site:

- Embryonic shifting dunes
- Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes)
- Fixed coastal dunes with herbaceous vegetation (grey dunes)
- Dunes with *Salix repens* ssp. *argentea* (Salicion arenariae)

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

- Humid dune slacks

Key Vulnerabilities (North East Kent)[46]

- Changes in species distribution
- Invasive species
- Public access/ disturbance
- Hydrological changes
- Air pollution
- Water pollution
- Fisheries: commercial, marine and estuarine

[45] https://sac.jncc.gov.uk/site/UK0013077
[46] http://publications.naturalengland.org.uk/publication/6259686785417216

Appendix C Nutrient Neutrality Calculations - Nitrogen

ANP7a – Agri/Cowan's Land

Table 3. Stage 1 Nitrogen WwTW Effluent

Site Allocation	Policy ANP7a
Site Name	Agri/Cowan's Land
Number of Residential Dwellings	95
Number of New Residents	228
Water Consumption (person/day)	110
Total Wastewater Generated by development (litres/day)	25,080
Likely Wastewater Treatment Works (WwTW)	Dambridge WwTW
TN Environmental permit for WwTW (mg/litres/TN)	27
90% of Consent Limit	24.3
TN Discharge after WwTW Treatment (mg/TN/day)	609,044
TN Discharge after WwTW Treatment (kg/TN/day)	0.609444
TN Discharge after WwTW Treatment (kg/TN/year)	222.44706

Table 4. Stage 2 Nitrogen Loss from Existing Land Use

Site Allocation	Policy ANP7a
Site Area	3.23
Discounted Land use (ha)	2.43
Site Area Discounting Non-agricultural Uses (ha)	0.8
Current Land Use	Horse Pasture
Estimated Total Nitrogen Loss (kg/ha/yr)	12.2
Estimated Total Loss (kg/ha/yr) for Whole allocation)	9.76

Table 5. Stage 3 Nitrogen Loss from Future Land Use

Site Allocation	Policy ANP7a
Number of New Residents	228
Total Site Area (ha)	3.23
Type of Development	Urban
Total Urban Surface Area	3.23
Urban Nitrogen Leachate standard (kg/N/ha/yr)	14.3
Urban Nitrogen Leachate for Site Allocation	46.189
Public Open Space (Y/N)	No
Total Open Space Area (ha)	0

Site Allocation	Policy ANP7a
Total Greenspace Nitrogen Leachate for Site Allocation	0
Overall Leachate from All Surfaces (kg/N/ha/yr)	46.189

Table 6. Stage 4 – Total Nitrogen Budget (ANP7a)

Step	Bringing the Stages Together	TN Discharge (kg/N/ha/yr)
1	Total Nitrogen Load from Wastewater Discharge	222.44706
2	Future Land Use	46.189
	Existing Land Use	9.76
	Net Change in Nitrogen Discharge from Changes in Land Use	36.429
3	Nitrogen Budget	258.87606
4	20% of Nitrogen Budget	51.775212
5	Nitrogen Budget with 20% Buffer	**310.651272**

ANP7b – Old Council Yard

Table 7. Stage 1 Nitrogen WwTW Effluent

Site Allocation	Policy ANP7b
Site Name	Old Council Yard
Number of Residential Dwellings	5
Number of New Residents	12
Water Consumption (person/day)	110
Total Wastewater Generated by development (litres/day)	1,320
Likely Wastewater Treatment Works (WwTW)	Dambridge WwTW
TN Environmental permit for WwTW (mg/litres/TN)	27
90% of Consent Limit	24.3
TN Discharge after WwTW Treatment (mg/TN/day)	32,076
TN Discharge after WwTW Treatment (kg/TN/day)	0.032076
TN Discharge after WwTW Treatment (kg/TN/year)	11.70774

Table 8. Stage 2 Nitrogen Loss from Existing Land Use

Site Allocation	Policy ANP7b
Site Area	0.2
Discounted Land use (ha)	0.2
Site Area Discounting Non-agricultural Uses (ha)	0
Current Land Use	Hardstanding
Estimated Total Nitrogen Loss (kg/ha/yr)	0
Estimated Total Loss (kg/ha/yr) for Whole Allocation	0

Table 9. Stage 3 Nitrogen Loss from Future Land Use

Site Allocation	Policy ANP7b
Number of New Residents	12
Total Site Area (ha)	0.2
Type of Development	Urban
Total Urban Surface Area	0.2
Urban Nitrogen Leachate standard (kg/N/ha/yr)	14.3
Urban Nitrogen Leachate for Site Allocation	2.86
Public Open Space (Y/N)	No
Total Open Space Area (ha)	0
Total Greenspace Nitrogen Leachate for Site Allocation	0
Overall Leachate from All Surfaces (kg/N/ha/yr)	2.86

Table 10. Stage 4 – Total Nitrogen Budget (ANP7b)

Step	Bringing the Stages Together	TN Discharge (kg/N/ha/yr)
1	Total Nitrogen Load from Wastewater Discharge	11.70774
2	Future Land Use	2.86
	Existing Land Use	0
	Net Change in Nitrogen Discharge from Changes in Land Use	2.86
3	Nitrogen Budget	14.56774
4	20% of Nitrogen Budget	2.913548
5	Nitrogen Budget with 20% Buffer	**17.481288**

ANP7c – Land South of Mill Field

Table 11. Stage 1 Nitrogen WwTW Effluent

Site Allocation	Policy ANP7c
Site Name	Land South of Mill Field
Number of Residential Dwellings	9
Number of New Residents	21
Water Consumption (person/day)	110
Total Wastewater Generated by development (litres/day)	2,376
Likely Wastewater Treatment Works (WwTW)	Dambridge WwTW
TN Environmental permit for WwTW (mg/litres/TN)	27
90% of Consent Limit	24.3
TN Discharge after WwTW Treatment (mg/TN/day)	57,736.8
TN Discharge after WwTW Treatment (kg/TN/day)	0.0577368
TN Discharge after WwTW Treatment (kg/TN/year)	21.073932

Table 12. Stage 2 Nitrogen Loss from Existing Land Use

Site Allocation	Policy ANP7c
Site Area	0.4
Discounted Land use (ha)	0.4
Site Area Discounting Non-agricultural Uses (ha)	0
Current Land Use	Scrubland
Estimated Total Nitrogen Loss (kg/ha/yr)	0
Estimated Total Loss (kg/ha/yr) for Whole Allocation	0

Table 13. Stage 3 Nitrogen Loss from Future Land Use

Site Allocation	Policy ANP7c
Number of New Residents	21.6
Total Site Area (ha)	0.4
Type of Development	Urban
Total Urban Surface Area	0.4
Urban Nitrogen Leachate standard (kg/N/ha/yr)	14.3
Urban Nitrogen Leachate for Site Allocation	5.72
Public Open Space (Y/N)	No
Total Open Space Area (ha)	0
Total Greenspace Nitrogen Leachate for Site Allocation	0
Overall Leachate from All Surfaces (kg/N/ha/yr)	5.72

Table 14. Stage 4 – Total Nitrogen Budget (ANP7c)

Step	Bringing the Stages Together	TN Discharge (kg/N/ha/yr)
1	Total Nitrogen Load from Wastewater Discharge	21.073932
2	Future Land Use	5.72
	Existing Land Use	0
	Net Change in Nitrogen Discharge from Changes in Land Use	5.72
3	Nitrogen Budget	26.793932
4	20% of Nitrogen Budget	5.3587864
5	Nitrogen Budget with 20% Buffer	**32.1527184**

ANP7d – Land North of Molland Lane

Table 15. Stage 1 Nitrogen WwTW Effluent

Site Allocation	Policy ANP7d
Site Name	Land North of Molland Lane
Number of Residential Dwellings	105
Number of New Residents	252
Water Consumption (person/day)	110
Total Wastewater Generated by development (litres/day)	27,720
Likely Wastewater Treatment Works (WwTW)	Dambridge WwTW
TN Environmental permit for WwTW (mg/litres/TN)	27
90% of Consent Limit	24.3
TN Discharge after WwTW Treatment (mg/TN/day)	673,596
TN Discharge after WwTW Treatment (kg/TN/day)	0.673596
TN Discharge after WwTW Treatment (kg/TN/year)	245.86254

Table 16. Stage 2 Nitrogen Loss from Existing Land Use

Site Allocation	Policy ANP7d
Site Area	3.8
Discounted Land use (ha)	0
Site Area Discounting Non-agricultural Uses (ha)	3.8
Current Land Use	General Cropping
Estimated Total Nitrogen Loss (kg/ha/yr)	27.9
Estimated Total Loss (kg/ha/yr) for Whole Allocation	106.02

Table 17. Stage 3 Nitrogen Loss from Future Land Use

Site Allocation	Policy ANP7d
Number of New Residents	252
Total Site Area (ha)	3.8
Type of Development	Urban
Total Urban Surface Area	3.8
Urban Nitrogen Leachate standard (kg/N/ha/yr)	14.3
Urban Nitrogen Leachate for Site Allocation	54.34
Public Open Space (Y/N)	No
Total Open Space Area (ha)	0
Total Greenspace Nitrogen Leachate for Site Allocation	0
Overall Leachate from All Surfaces (kg/N/ha/yr)	54.34

Table 18. Stage 4 – Total Nitrogen Budget (ANP7d)

Step	Bringing the Stages Together	TN Discharge (kg/N/ha/yr)
1	Total Nitrogen Load from Wastewater Discharge	245.86254
2	Future Land Use	54.34
	Existing Land Use	106.02
	Net Change in Nitrogen Discharge from Changes in Land Use	-51.68
3	Nitrogen Budget	194.18254
4	20% of Nitrogen Budget	38.836508
5	Nitrogen Budget with 20% Buffer	**233.019048**

ANP7e – Land South of Guilton

Table 19. Stage 1 Nitrogen WwTW Effluent

Site Allocation	Policy ANP7e
Site Name	Land South of Guilton
Number of Residential Dwellings	9
Number of New Residents	21.6
Water Consumption (person/day)	110
Total Wastewater Generated by development (litres/day)	2,376
Likely Wastewater Treatment Works (WwTW)	Dambridge WwTW
TN Environmental permit for WwTW (mg/litres/TN)	27
90% of Consent Limit	24.3
TN Discharge after WwTW Treatment (mg/TN/day)	57,736.8
TN Discharge after WwTW Treatment (kg/TN/day)	0.05577368
TN Discharge after WwTW Treatment (kg/TN/year)	21.073932

Table 20. Stage 2 Nitrogen Loss from Existing Land Use

Site Allocation	Policy ANP7e
Site Area	0.5
Discounted Land use (ha)	0.5
Site Area Discounting Non-agricultural Uses (ha)	0
Current Land Use	Hardstanding
Estimated Total Nitrogen Loss (kg/ha/yr)	0
Estimated Total Loss (kg/ha/yr) for Whole Allocation	0

Table 21. Stage 3 Nitrogen Loss from Future Land Use

Site Allocation	Policy ANP7e
Number of New Residents	21.6
Total Site Area (ha)	0.5
Type of Development	Urban
Total Urban Surface Area	0.5
Urban Nitrogen Leachate standard (kg/N/ha/yr)	14.3
Urban Nitrogen Leachate for Site Allocation	7.15
Public Open Space (Y/N)	No
Total Open Space Area (ha)	0
Total Greenspace Nitrogen Leachate for Site Allocation	0
Overall Leachate from All Surfaces (kg/N/ha/yr)	7.15

Table 22. Stage 4 – Total Nitrogen Budget (ANP7e)

Step	Bringing the Stages Together	TN Discharge (kg/N/ha/yr)
1	Total Nitrogen Load from Wastewater Discharge	21.073932
2	Future Land Use	7.15
	Existing Land Use	0
	Net Change in Nitrogen Discharge from Changes in Land Use	7.15
3	Nitrogen Budget	28.223932
4	20% of Nitrogen Budget	5.6447864
5	Nitrogen Budget with 20% Buffer	**33.8687184**

Appendix D Nutrient Neutrality Calculations – Phosphorous

ANP7a – Agri/Cowan's Land

Table 23. Stage 1 Phosphorous WwTW Effluent

Site Allocation	Policy ANP7a
Site Name	Agri/Cowan's Land
Number of Residential Dwellings	95
Number of New Residents	228
Water Consumption (person/day)	110
Total Wastewater Generated by development (litres/day)	25,080
Likely Wastewater Treatment Works (WwTW)	Dambridge WwTW
TP Environmental permit for WwTW (mg/litres/TP)	2
90% of Consent Limit	1.8
TP Discharge after WwTW Treatment (mg/TP/day)	45,144
TP Discharge after WwTW Treatment (kg/TP/day)	0.045144
TP Discharge after WwTW Treatment (kg/TP/year)	16.47756

Table 24. Stage 2 Phosphorous Loss from Existing Land Use

Site Allocation	Policy ANP7a
Site Area	3.23
Discounted Land use (ha)	2.43
Site Area Discounting Non-agricultural Uses (ha)	0.8
Current Land Use	Horse Pasture
Estimated Total Phosphorous Loss (kg/ha/yr)	0.24
Estimated Total Loss (kg/ha/yr) for Whole allocation	0.192

Table 25. Stage 3 Phosphorous Loss from Future Land Use

Site Allocation	Policy ANP7a
Number of New Residents	228
Total Site Area (ha)	3.23
Type of Development	Urban
Total Urban Surface Area	3.23
Urban Phosphorous Leachate standard (kg/P/ha/yr)	0.83
Urban Phosphorous Leachate for Site Allocation	2.6809
Public Open Space (Y/N)	No
Total Open Space Area (ha)	0

Site Allocation	Policy ANP7a
Total Greenspace Phosphorus Leachate for Site Allocation	0
Overall Leachate from All Surfaces (kg/P/ha/yr)	2.6809

Table 26. Stage 4 – Total Phosphorous Budget (ANP7a)

Step	Bringing the Stages Together	TN Discharge (kg/P/ha/yr)
1	Total Phosphorous Load from Wastewater Discharge	16.47756
2	Future Land Use	2.06809
	Existing Land Use	0.192
	Net Change in Phosphorous Discharge from Changes in Land Use	2.4889
3	Phosphorous Budget	18.96646
4	20% of Phosphorous Budget	3.793292
5	Phosphorous Budget with 20% Buffer	**22.759752**

ANP7b – Old Council Yard

Table 27. Stage 1 Phosphorous WwTW Effluent

Site Allocation	Policy ANP7b
Site Name	Old Council Yard
Number of Residential Dwellings	5
Number of New Residents	12
Water Consumption (person/day)	110
Total Wastewater Generated by development (litres/day)	1,320
Likely Wastewater Treatment Works (WwTW)	Dambridge WwTW
TP Environmental permit for WwTW (mg/litres/TP)	2
90% of Consent Limit	1.8
TP Discharge after WwTW Treatment (mg/TP/day)	2,376
TP Discharge after WwTW Treatment (kg/TP/day)	0.002376
TP Discharge after WwTW Treatment (kg/TP/year)	0.86724

Table 28. Stage 2 Phosphorous Loss from Existing Land Use

Site Allocation	Policy ANP7b
Site Area	0.2
Discounted Land use (ha)	0.2
Site Area Discounting Non-agricultural Uses (ha)	0
Current Land Use	Hardstanding

Site Allocation	Policy ANP7b
Estimated Total Phosphorous Loss (kg/ha/yr)	0
Estimated Total Loss (kg/ha/yr) for Whole Allocation	0

Table 29. Stage 3 Phosphorous Loss from Future Land Use

Site Allocation	Policy ANP7b
Number of New Residents	12
Total Site Area (ha)	0.2
Type of Development	Urban
Total Urban Surface Area	0.2
Urban Phosphorous Leachate standard (kg/P/ha/yr)	0.83
Urban Phosphorous Leachate for Site Allocation	0.166
Public Open Space (Y/N)	No
Total Open Space Area (ha)	0
Total Greenspace Phosphorous Leachate for Site Allocation	0
Overall Leachate from All Surfaces (kg/P/ha/yr)	0.166

Table 30. Stage 4 – Total Phosphorous Budget (ANP7b)

Step	Bringing the Stages Together	TN Discharge (kg/P/ha/yr)
1	Total Phosphorous Load from Wastewater Discharge	0.86724
2	Future Land Use	0.166
	Existing Land Use	0
	Net Change in Phosphorous Discharge from Changes in Land Use	0.166
3	Phosphorous Budget	1.03324
4	20% of Phosphorous Budget	0.206648
5	Phosphorous Budget with 20% Buffer	**1.239888**

ANP7c – Land South of Mill Field

Table 31. Stage 1 Phosphorous WwTW Effluent

Site Allocation	Policy ANP7c
Site Name	Land South of Mill Field
Number of Residential Dwellings	9
Number of New Residents	21.6
Water Consumption (person/day)	110
Total Wastewater Generated by development (litres/day)	2,376

Site Allocation	Policy ANP7c
Likely Wastewater Treatment Works (WwTW)	Dambridge WwTW
TP Environmental permit for WwTW (mg/litres/TP)	2
90% of Consent Limit	1.8
TP Discharge after WwTW Treatment (mg/TP/day)	4,276.8
TP Discharge after WwTW Treatment (kg/TP/day)	0.0042768
TP Discharge after WwTW Treatment (kg/TP/year)	1.561032

Table 32. Stage 2 Phosphorous Loss from Existing Land Use

Site Allocation	Policy ANP7c
Site Area	0.4
Discounted Land use (ha)	0.4
Site Area Discounting Non-agricultural Uses (ha)	0
Current Land Use	Scrubland
Estimated Total Phosphorous Loss (kg/ha/yr)	0
Estimated Total Loss (kg/ha/yr) for Whole Allocation	0

Table 33. Stage 3 Phosphorous Loss from Future Land Use

Site Allocation	Policy ANP7c
Number of New Residents	21.6
Total Site Area (ha)	0.4
Type of Development	Urban
Total Urban Surface Area	0.4
Urban Phosphorous Leachate standard (kg/P/ha/yr)	0.83
Urban Phosphorous Leachate for Site Allocation	0.332
Public Open Space (Y/N)	No
Total Open Space Area (ha)	0
Total Greenspace Phosphorous Leachate for Site Allocation	0
Overall Leachate from All Surfaces (kg/P/ha/yr)	0.332

Table 34. Stage 4 – Total Phosphorous Budget (ANP7c)

Step	Bringing the Stages Together	TN Discharge (kg/P/ha/yr)
1	Total Phosphorous Load from Wastewater Discharge	1.561032
2	Future Land Use	0.332
	Existing Land Use	0
	Net Change in Phosphorous Discharge from Changes in Land Use	0.332
3	Phosphorous Budget	1.893032
4	20% of Phosphorous Budget	50.3786064

Step	Bringing the Stages Together	TN Discharge (kg/P/ha/yr)
5	Phosphorous Budget with 20% Buffer	**2.2716384**

ANP7d – Land North of Molland Lane

Table 35. Stage 1 Phosphorous WwTW Effluent

Site Allocation	Policy ANP7d
Site Name	Land North of Molland Lane
Number of Residential Dwellings	105
Number of New Residents	252
Water Consumption (person/day)	110
Total Wastewater Generated by development (litres/day)	27,720
Likely Wastewater Treatment Works (WwTW)	Dambridge WwTW
TN Environmental permit for WwTW (mg/litres/TP)	2
90% of Consent Limit	1.8
TP Discharge after WwTW Treatment (mg/TP/day)	4,9896
TP Discharge after WwTW Treatment (kg/TP/day)	0.049896
TP Discharge after WwTW Treatment (kg/TP/year)	18.21204

Table 36. Stage 2 Phosphorous Loss from Existing Land Use

Site Allocation	Policy ANP7d
Site Area	3.8
Discounted Land use (ha)	0
Site Area Discounting Non-agricultural Uses (ha)	3.8
Current Land Use	General Cropping
Estimated Total Phosphorous Loss (kg/ha/yr)	0.28
Estimated Total Loss (kg/ha/yr) for Whole Allocation	1.064

Table 37. Stage 3 Phosphorous Loss from Future Land Use

Site Allocation	Policy ANP7d
Number of New Residents	252
Total Site Area (ha)	3.8
Type of Development	Urban
Total Urban Surface Area	3.8
Urban Phosphorous Leachate standard (kg/P/ha/yr)	0.83
Urban Phosphorous Leachate for Site Allocation	3.154
Public Open Space (Y/N)	No
Total Open Space Area (ha)	0

Site Allocation	Policy ANP7d
Total Greenspace Phosphorous Leachate for Site Allocation	0
Overall Leachate from All Surfaces (kg/P/ha/yr)	3.154

Table 38. Stage 4 – Total Phosphorous Budget (ANP7d)

Step	Bringing the Stages Together	TN Discharge (kg/P/ha/yr)
1	Total Phosphorous Load from Wastewater Discharge	18.21204
2	Future Land Use	3.154
	Existing Land Use	1.064
	Net Change in Phosphorous Discharge from Changes in Land Use	2.09
3	Phosphorous Budget	20.30204
4	20% of Phosphorous Budget	4.060408
5	Phosphorous Budget with 20% Buffer	**24.362448**

ANP7e – Land South of Guilton

Table 39. Stage 1 Phosphorous WwTW Effluent

Site Allocation	Policy ANP7e
Site Name	Land South of Guilton
Number of Residential Dwellings	9
Number of New Residents	21.6
Water Consumption (person/day)	110
Total Wastewater Generated by development (litres/day)	2,376
Likely Wastewater Treatment Works (WwTW)	Dambridge WwTW
TP Environmental permit for WwTW (mg/litres/TP)	2
90% of Consent Limit	1.8
TP Discharge after WwTW Treatment (mg/TP/day)	4276.8
TP Discharge after WwTW Treatment (kg/TP/day)	0.0042768
TP Discharge after WwTW Treatment (kg/TP/year)	1.561032

Table 40. Stage 2 Phosphorous Loss from Existing Land Use

Site Allocation	Policy ANP7e
Site Area	0.5
Discounted Land use (ha)	0.5
Site Area Discounting Non-agricultural Uses (ha)	0
Current Land Use	Hardstanding

Site Allocation	Policy ANP7e
Estimated Total Phosphorous Loss (kg/ha/yr)	0
Estimated Total Loss (kg/ha/yr) for Whole Allocation	0

Table 41. Stage 3 Phosphorous Loss from Future Land Use

Site Allocation	Policy ANP7e
Number of New Residents	21.6
Total Site Area (ha)	0.5
Type of Development	Urban
Total Urban Surface Area	0.5
Urban Phosphorous Leachate standard (kg/P/ha/yr)	0.83
Urban Phosphorous Leachate for Site Allocation	0.415
Public Open Space (Y/N)	No
Total Open Space Area (ha)	0
Total Greenspace Phosphorous Leachate for Site Allocation	0
Overall Leachate from All Surfaces (kg/P/ha/yr)	0.415

Table 42. Stage 4 – Total Phosphorous Budget (ANP7e)

Step	Bringing the Stages Together	TN Discharge (kg/P/ha/yr)
1	Total Phosphorous Load from Wastewater Discharge	1.561032
2	Future Land Use	0.415
	Existing Land Use	0
	Net Change in Phosphorous Discharge from Changes in Land Use	0.415
3	Phosphorous Budget	1.976032
4	20% of Phosphorous Budget	0.3952064
5	Phosphorous Budget with 20% Buffer	**2.3712384**

Appendix E Air Quality Assessment Data

Table 43. Total Annual Mean NOx (ug/m^3)

Transect	Distance from Road (m)	Base	DN 2040	DM2040	DS1 2040	DS2 2040	DS2 – DS1
North	80	21.7	12.6	12.7	13.2	13.2	<0.1
	85	21.4	12.5	12.5	13.0	13.0	<0.1
	90	21.0	12.3	12.4	12.8	12.9	0.1
	95	20.7	12.2	12.3	12.7	12.8	0.1
	100	20.5	12.1	12.2	12.6	12.6	<0.1
	110	20.0	11.9	12.0	12.4	12.4	<0.1
	120	19.6	11.8	11.8	12.2	12.2	<0.1
	130	19.2	11.6	11.7	12.0	12.1	0.1
	140	18.9	11.5	11.6	11.9	11.9	<0.1
	150	18.6	11.4	11.5	11.8	11.8	<0.1
	160	18.4	11.3	11.4	11.7	11.7	<0.1
	170	18.1	11.2	11.3	11.5	11.6	0.1
	180	17.9	11.2	11.2	11.5	11.5	<0.1
Central	85	22.7	13.5	13.5	14.0	14.1	0.1
	90	22.3	13.3	13.4	13.8	13.9	0.1
	95	22.0	13.2	13.2	13.7	13.7	<0.1
	100	21.6	13.1	13.1	13.5	13.6	0.1
	105	21.3	12.9	13.0	13.4	13.4	<0.1
	115	20.8	12.7	12.8	13.2	13.2	<0.1
	125	20.4	12.6	12.6	13.0	13.0	<0.1
	135	20.0	12.4	12.5	12.8	12.8	<0.1

	145	19.6	12.3	12.3	12.6	12.7	0.1
	155	19.3	12.2	12.2	12.5	12.5	<0.1
	165	19.0	12.1	12.1	12.4	12.4	<0.1
	175	18.8	12.0	12.0	12.3	12.3	<0.1
	185	18.6	11.9	11.9	12.2	12.2	<0.1
South	60	28.3	15.5	15.6	16.4	16.4	<0.1
	65	27.3	15.1	15.2	15.9	16.0	0.1
	70	26.4	14.8	14.9	15.5	15.6	0.1
	75	25.6	14.5	14.6	15.2	15.2	<0.1
	80	24.8	14.2	14.3	14.8	14.9	0.1
	90	23.6	13.7	13.8	14.3	14.4	0.1
	100	22.6	13.4	13.4	13.9	13.9	<0.1
	110	21.8	13.1	13.1	13.5	13.6	0.1
	120	21.1	12.8	12.9	13.2	13.3	0.1
	130	20.5	12.6	12.6	13.0	13.0	<0.1
	140	20.0	12.4	12.5	12.8	12.8	<0.1
	150	19.6	12.3	12.3	12.6	12.6	<0.1
	160	19.2	12.1	12.2	12.4	12.5	0.1

Table 44. Total Annual Mean Nitrogen Deposition (Keq/ha/yr)

Transect	Distance from Road (m)	Base	DN 2040	DM2040	DS1 2040	DS2 2040	DS2 – DS1
North	80	15.7	16.3	16.4	16.7	16.8	0.1
	85	15.6	16.2	16.2	16.6	16.6	<0.1
	90	15.5	16.0	16.1	16.4	16.5	0.1
	95	15.4	15.9	16.0	16.3	16.3	<0.1
	100	15.3	15.8	15.9	16.2	16.2	<0.1
	110	15.1	15.6	15.6	15.9	16.0	0.1
	120	15.0	15.4	15.5	15.7	15.8	0.1
	130	14.9	15.3	15.3	15.6	15.6	<0.1
	140	14.8	15.2	15.2	15.4	15.4	<0.1
	150	14.7	15.0	15.1	15.3	15.3	<0.1
	160	14.6	14.9	15.0	15.2	15.2	<0.1
	170	14.5	14.8	14.9	15.1	15.1	<0.1
	180	14.4	14.8	14.8	15.0	15.0	<0.1
Central	85	15.7	16.2	16.3	16.6	16.7	0.1
	90	15.6	16.1	16.1	16.5	16.5	<0.1
	95	15.5	15.9	16.0	16.3	16.3	<0.1
	100	15.4	15.8	15.9	16.1	16.2	0.1
	105	15.3	15.7	15.7	16.0	16.0	<0.1
	115	15.1	15.5	15.5	15.8	15.8	<0.1
	125	14.9	15.3	15.3	15.6	15.6	<0.1
	135	14.8	15.1	15.2	15.4	15.4	<0.1
	145	14.7	15.0	15.0	15.2	15.2	<0.1
	155	14.6	14.9	14.9	15.1	15.1	<0.1

	165	14.5	14.8	14.8	15.0	15.0	<0.1
	175	14.4	14.7	14.7	14.9	14.9	<0.1
	185	14.3	14.6	14.6	14.8	14.8	<0.1
South	60	17.1	17.7	17.8	18.3	18.3	<0.1
	65	16.8	17.3	17.4	17.9	17.9	<0.1
	70	16.5	17.0	17.1	17.5	17.6	0.1
	75	16.3	16.8	16.8	17.3	17.3	<0.1
	80	16.1	16.5	16.6	17.0	17.0	<0.1
	90	15.7	16.1	16.2	16.5	16.6	0.1
	100	15.4	15.8	15.9	16.2	16.2	<0.1
	110	15.2	15.5	15.6	15.9	15.9	<0.1
	120	15.0	15.3	15.4	15.6	15.6	<0.1
	130	14.8	15.1	15.2	15.4	15.4	<0.1
	140	14.7	15.0	15.0	15.2	15.2	<0.1
	150	14.6	14.8	14.9	15.0	15.1	0.1
	160	14.4	14.7	14.7	14.9	14.9	<0.1

Appendix F Traffic & Air Quality Modelling Method

AECOM Imagine it. Delivered.

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Project name:
Ash Neighbourhood Plan

Project ref:
60571087_DR-10876-Ash Facil

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Effect of Ash Neighbourhood Plan on Sandwich Bay SAC

Overview

The area affected by the Ash neighbourhood plan is in Kent. The Sandwich Bay Special Area of Conservation (SAC) could be affected by the neighbourhood plan as the A256 is within 200m of the SAC. This project considers the impact of changes in traffic flow on A256 due to the Ash Neighbourhood Plan on concentrations of nitrogen oxides (NOx), ammonia (NH_3) and nitrogen deposition at transects within the Sandwich Bay Special Area of Conservation (SAC). Figure 1 shows the traffic network, ecological receptors and SAC considered in this project.

Figure 1 Base Traffic Network, Ecological Receptors and SAC

Methodology

Traffic Data

The road network includes a single link along the A256 which is approximately 80 m from the Sandwich Bay SAC. Traffic data in the form of 24-hour AADT (Annual Average Daily Traffic) based on 2018 data were provided by the AECOM transport team for the following scenarios:

1. 2018 Baseline;
2. 2040 Do Nothing (DN) – background traffic growth only;
3. 2040 Do Minimum (DM) – consented developments only;
4. 2040 Do Something 1 (DS1) – includes consented developments, without the Ash Neighbourhood Plan;
5. 2040 Do Something 2 (DS2) – includes consented developments, with Ash Neighbourhood Plan.

The following methodology was used to derive the traffic flows for the air quality assessment:

- Additional vehicle trips (24hr AADT) forecast to travel along the A256 were based on residential site allocations within Dover, with employment captured indirectly by TEMPRO growth;
- Residential site allocations (13,623 dwellings) located across the entire Dover district were adjusted proportionally by area to represent a linear delivery of 6,300 dwellings by 2030, and 12,600 dwellings by 2040;
- Consented developments were included as part of the above, therefore only additional non-consented schemes (5,371 dwellings in 2030/ 10,741 dwellings in 2040) were included to identify additional vehicle trips on the A256 relative to the Do Minimum;

- Sites were grouped based on location (five separate areas, grouped MSOAs) within Dover to inform the trip distribution exercise, with a separate distribution applied to the Whitfield development (4,434 dwellings) based on the Transport Assessment;
- Trip generation was derived by extracting vehicle trip rates (AM peak, PM peak and weekday 12 hour) from transport reports submitted in support of recent planning applications within the Dover district, sourced from TRICS;
- Average trip rates were adopted and converted to 12 hours based on available trip rate information for the peak hours and 12 hour periods;
- Separate trip rates were identified and derived for the Whitfield development (4,434 dwellings) based on the Transport Assessment;
- Recent DfT count data were obtained for the A256 to identify differences between 12 hour weekday flows and 24 hour AADT flows, upon which a factor was subsequently derived (based on light vehicles, to represent residential trips)
- Weekday 12 hour trip rates were then converted to 24hr AADT trip rates by applying the factor derived from DfT count data for the A256, in the absence of 24 hour trip rates;
- The two-way daily (24 hour) trip generation calculated for each area was equally split between arrivals and departures;
- Vehicle trips were split between light vehicles (99.3%) and HDVs (0.7%) based on TRICS data for sites comprising mixed private/ affordable housing in the South East;
- Routeplanner was used to identify which destinations (MSOA and District level) would attract trips along the A256, from each point of origin (site allocations grouped into five areas);
- The 'WU03EW - Location of usual residence and place of work by method of travel to work (MSOA level)' dataset of the 2011 Census database was used to identify residents travelling to these destinations by car or motorcycle;
- Residents travelling to these destinations (using the A256) were calculated as a proportion of all residents originating within each area (grouped MSOAs) to all destinations by car or motorcycle. The proportion was applied to the daily (24 hour) trip generation to identify additional vehicle trips expected to travel along the A256 as a result of site allocations within each area. The same distribution was adopted for arrivals and departures;
- The average TEMPRO growth (NTEM) was derived for four districts (Dover, Thanet, Shepway and Canterbury) to better reflect forecast traffic growth along the A256, utilising origin and destination values;
- Local adjusted growth factors were then derived for light vehicles, by comparing the four districts with the South East region, and factoring this by the NTM growth forecast for the South East region (Principal Roads);
- HDVs were factored solely using NTM growth forecast for the South East region (Principal Roads) without any local adjustment, or application of alternative assumptions (see below);
- The average TEMPRO growth (NTEM) was adjusted using alternative assumptions based on the number of dwellings considered directly for each scenario, and applied to light vehicles, with employment growth unadjusted;
- Scenarios include Do Minimum (Consented Schemes only), Do Something 1 (Consented Schemes + Site Allocations excluding Ash NP), Do Something 2 (Consented Schemes + Site Allocations including Ash NP);
- The Ash NP area includes the allocation of 330 dwellings (non-consented) in 2030, and 659 dwellings (non-consented) in 2040, based on a linear delivery;
- The DS1 and DS2 scenarios adopt the same level of background traffic growth, to allow a more objective comparison of the additional vehicle trips forecast to be generated by development in the Ash NP area;
- Additional vehicle trips along the A256 were subsequently identified in the form of 24hr AADT (by direction) and compared to 2030 and 2040 Do Minimum Flows.

Table 45 presents the 24-hour AADT, heavy duty vehicle (HDV) percentage and average speed used in the air quality assessment for the five scenarios.

Table 45 Traffic Data

Scenario	AADT	HDV %	Speed (kph)
2018 Baseline	25,654	19.07%	50
2040 Do Nothing (background growth)	30,849	19.02%	50
2040 Do Minimum (consented only)	31,612	18.58%	50
2040 DS1 (includes consented, w/o Ash)	36,709	16.10%	50
2040 DS2 (includes consented, with Ash)	37,318	15.85%	50

Receptors

Ecological receptors have been taken from the west side of the SAC, closest to the A256, up to 200m from the edge of the road, as three ‘transects’. The ecological receptors relevant to this project are included in Table 46, and their locations presented in Figure 1.

The northern-most transect, ‘North’, starts at 80m east of the A256 roadside; the southern-most transect ‘South’, starts at 60m east of the A256 roadside; the middle transect, ‘Central’, starts at 85m east of the A256 roadside.

Table 46 Receptor locations, height and distance from road

ID	X Coordinate	Y Coordinate	Height (m)	Distance from Road (m)
North_80m	633494	161126	0	80
North_85m	633499	161126	0	85
North_90m	633504	161126	0	90
North_95m	633509	161126	0	95
North_100m	633514	161126	0	100
North_110m	633524	161126	0	110
North_120m	633534	161127	0	120
North_130m	633544	161127	0	130
North_140m	633554	161127	0	140
North_150m	633564	161127	0	150
North_160m	633574	161128	0	160
North_170m	633584	161128	0	170
North_180m	633594	161128	0	180
Central_85m	633509	160516	0	85
Central_90m	633514	160516	0	90
Central_95m	633519	160516	0	95
Central_100m	633524	160515	0	100
Central_105m	633529	160515	0	105
Central_115m	633539	160514	0	115
Central_125m	633549	160513	0	125
Central_135m	633559	160512	0	135

Central_145m	633569	160511	0	145
Central_155m	633579	160510	0	155
Central_165m	633589	160509	0	165
Central_175m	633599	160508	0	175
Central_185m	633609	160507	0	185
South_60m	633430	160304	0	60
South_65m	633435	160302	0	65
South_70m	633440	160300	0	70
South_75m	633444	160298	0	75
South_80m	633449	160297	0	80
South_90m	633458	160293	0	90
South_100m	633468	160289	0	100
South_110m	633477	160286	0	110
South_120m	633487	160282	0	120
South_130m	633496	160279	0	130
South_140m	633505	160275	0	140
South_150m	633515	160272	0	150
South_160m	633524	160268	0	160

Model Setup

Road traffic emissions of NO_x were derived using Defra's current Emission Factor Toolkit (v9.0) [47] and the associated tools[48]. Vehicle emission factors for NH_3, used in the ecological assessment, were taken from Air Quality Consultants' 'Calculator for Road Emissions of Ammonia' (CREAM V1A)[49]. Detailed dispersion modelling was undertaken using ADMS-Roads v5.0 to model concentrations of NO_x and NH_3 using the settings in Table 47.

Table 47 General ADMS-Roads Model Conditions

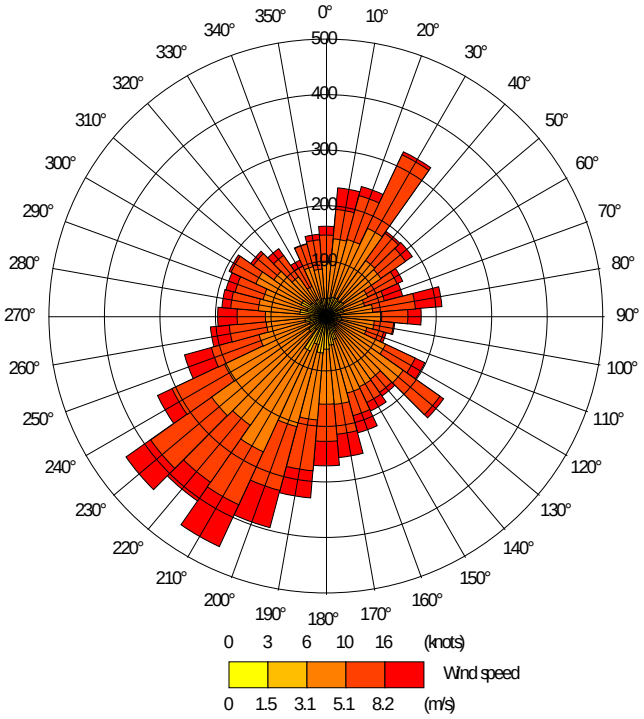
Variables	ADMS-Roads Model Input: Road Traffic Model
Surface roughness at source at meteorological site	0.02m
Minimum Monin-Obukhov length for stable conditions	10m
Receptor location	x, y coordinates determined by GIS, z = 0m for ecological receptors.
Emissions	NO_x, NH_3
Emission factors	EFT Version 9.0 for NOx CREAM Version V1A for NH_3
Meteorological data	1 year (2018) hourly sequential data from Manston meteorological station.
Receptors	Ecological transects
Model output	Long-term annual mean NO_x and NH_3 concentrations.

[47] Department for Environment, Food and Rural Affairs (2019), Emission Factor Toolkit v9.0, http://laqm.defra.gov.uk/review-and-assessment/tools/emissions-factors-toolkit.html
[48] Department for Environment, Food and Rural Affairs (2019), NOx to NO_2 Calculator v7.1, https://laqm.defra.gov.uk/documents/NOx_to_NO2_Calculator_v7.1.xlsm
[49] Air Quality Consultants (2020). 'Calculator for Road Emissions of Ammonia' (CREAM V1A). Available online at: https://www.aqconsultants.co.uk/resources/calculator-for-road-emissions-of-ammonia

Meteorological Data

One year (2018) of hourly sequential observation data from Manston meteorological station has been used in this assessment to correspond with the baseline year. The station is located approximately 6.5km north of the modelled road and experiences meteorological conditions that are representative of those experienced within the air quality study area. Figure 2 shows that the dominant direction of wind is from the south-west, as is typical for the UK. The wind speed ranges from 0-16 knots (0 - ~ 8.2 m/s).

Figure 2 Wind Rose of Manston Met Data 2018



Background Data

Background data for NO_2 and NOx concentrations for 2018 and 2030 have been sourced from Defra's 2017-based background maps for receptors within the nearest 1km by 1km grid squares (Table 48). The data shows that the mapped background concentrations are predicted to decrease between 2018 and 2030. Note that background concentrations for 2040 are not available and therefore 2030 backgrounds are used as they are the closest available to the assessment year. As background concentrations of NO_x and NO_2 will decrease in the future due to a cleaner vehicle fleet, this is a conservative assumption as concentrations in 2040 are expected to be lower than in 2030.

Table 48 Defra Mapped Background Pollutant Concentrations (µg/m³)

Grid Square (X, Y)	Annual Mean Concentrations			
	2018 NOx	2030 NOx	2018 NO_2	2030 NO_2
633500, 160500	14.9	10.5	10.9	7.9
633500, 161500	14.0	9.7	10.3	7.4

The Air Pollution Information System[50] (APIS) provides 'a searchable database and information on pollutants and their impacts on habitats and species'. The parameters for *Fixed coastal dune with herbaceous vegetation (acid grassland)*, for the 5x5 km grid square centred at 632500,162500 were taken from APIS for the receptors located within Sandwich Bay SAC, as presented in Table 49.

[50] Air Pollution Information System (APIS) available online at http://www.apis.ac.uk/

Table 49 Air Pollution Information System (APIS) Data.

Av. N Dep Rate kgN/ha/yr	Critical Load Av. N Dep Rate kgN/ha/yr	Total Av. Acid Dep Rate keq/ha/yr	Nitrogen Av. Acid Dep Rate keq/ha/yr	Critical Load Nitrogen Av. Acid Dep Rate keq/ha/yr	Ammonia µg/m^3	Habitat	APIS Data Year
13.1	8 - 10	1.07	0.132	0.223 - 0.438	1.05	Fixed Coastal Dunes	2016 - 2018

Nitrogen Deposition

Deposition of nitrogen from road-traffic derived NO_2 and NH_3 is estimated using the AQTAG deposition velocities that are also cited in the 2020 IAQM guidance[51], for the short vegetation (as opposed to 'forest'). The deposition velocities (and corresponding deposition conversion rates) are shown in Table 50. The deposition conversion rates are applied to the road-traffic derived NO_2 and NH_3 concentrations.

Table 50 Nitrogen Deposition Velocities – AQTAG and IAQM guidance

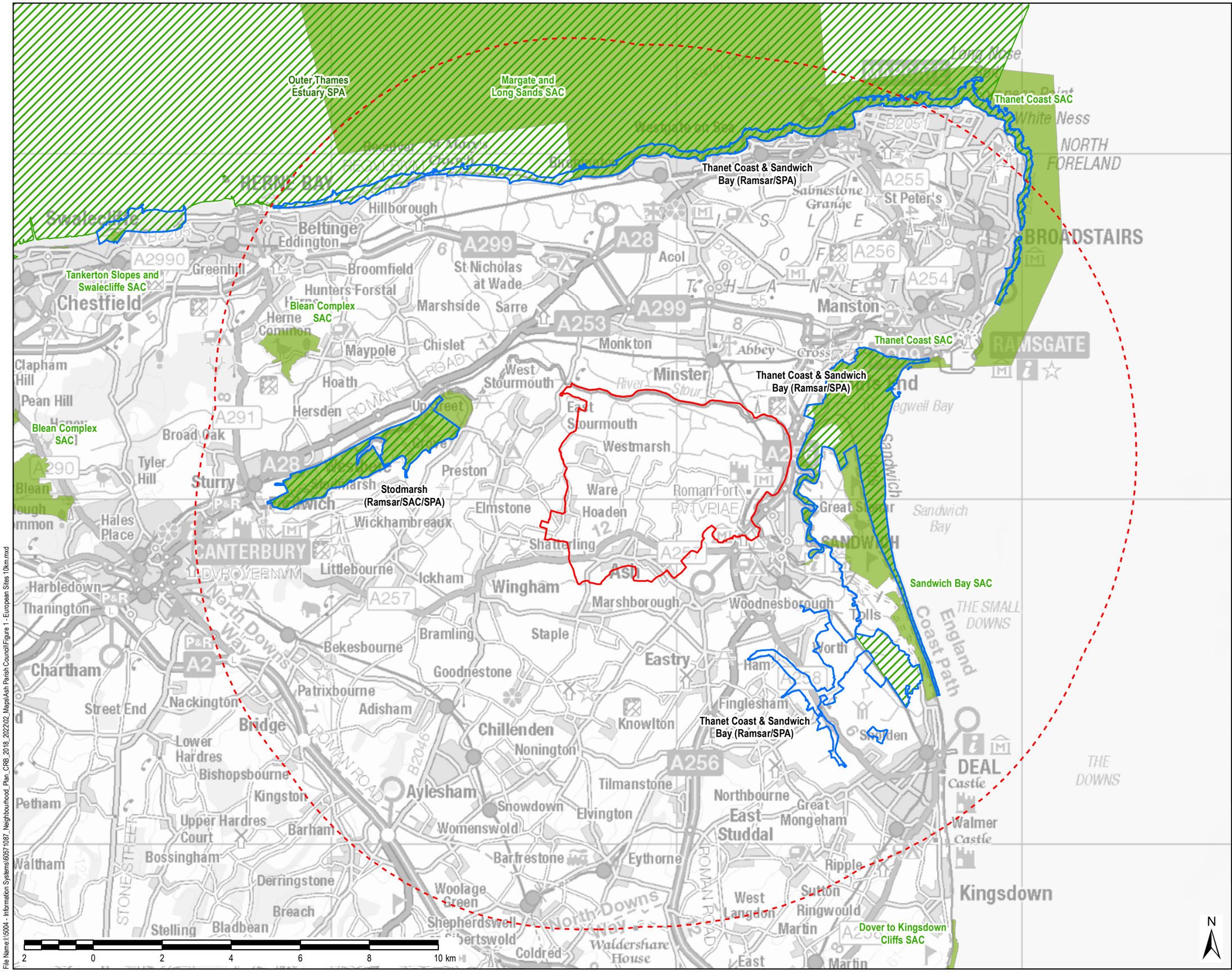
Pollutant	Deposition velocity	Conversion rate
NO_2	0.0015 m/s	1 µg/m^3 NO_2= 0.14 kgN/ha/yr
NH_3	0.020 m/s	1 µg/m^3 NH_3= 5.2 kgN/ha/yr

Model Verification

The closest available monitoring data to the SAC are NO_2 diffusion tubes located 500 m north of the SAC. The available data are therefore not suitable for the verification of the model. As such, a verification factor of 1.5 was applied to the road NOx emissions. This factor is based upon previous professional experience of air quality modelling using ADMS-Roads and is considered to be suitably conservative.

In the absence of roadside NH_3 monitoring data, a verification factor of 1.0 was applied to NH_3. This factor is supported by the fact that the tool was validated using monitoring data in Ashdown Forest.

[51] Holman et al (2020). A guide to the assessment of air quality impacts on designated nature conservation sites – version 1.1, Institute of Air Quality Management, London. Available at: https://iaqm.co.uk/text/guidance/air-quality-impacts-on-nature-sites-2020.pdf



File Name:I:\5004 - Information Systems\60571087_Neighbourhood_Plan_CRB_2018_2022\02_Maps\Ash Parish Council\Figure 1 - European Sites 10km.mxd

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LEGEND

- Ash Neighbourhood Plan Area
- Ash Neighbourhood Plan Area 10km Buffer
- Ramsar
- Special Protection Area (SPA)
- Special Area of Conservation (SAC)

Purpose of Issue: DRAFT

Client: LOCALITY

Project Title: ASH PARISH HRA

Drawing Title: DESIGNATED EUROPEAN SITES

Drawn	Checked	Approved	Date
CN	TD	AK	16/04/2020

AECOM Internal Project No.	Scale @ A3
60571087	1:100,000

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Drawing Number: FIGURE 1

Rev: 01

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LEGEND

Ash Neighbourhood Plan Area

Housing Allocation

- Site A - Agri/Cowan's Land - Policy ANP 7A
- Site B - Old Council Yard - Policy ANP 7B
- Site C - Land South of Mill Field - Policy ANP 7C
- Site D - Land North of Molland Lane - Policy ANP 7D
- Site E - Land South of Guilton - Poilcy ANP 7E

Purpose of Issue: DRAFT

Client: LOCALITY

Project Title: ASH PARISH HRA

Drawing Title: HOUSING ALLOCATIONS

Drawn	Checked	Approved	Date
CN	TD	AK	16/04/2020

AECOM Internal Project No.	Scale @ A3
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Rev: 01

200 0 200 400 600 800 1,000 m

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