Habitats Regulations Assessment of the Crawley Borough Council Local Plan

Submission Publication Consultation

Habitats Regulations Assessment Report

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LEPUS CONSULTING

LANDSCAPE, ECOLOGY, PLANNING & URBAN SUSTAINABILITY

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Photo: Lesser whirlpool ram's-horn snail (*Anisus vorticulus*) Pulborough Brooks SSSI RSPB Reserve, West Sussex, UK. Credit: Alex Hyde / Back from the Brink, Flickr

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Abbreviations

AA	Appropriate Assessment
AADT	Annual Average Daily Traffic
AIOSI	Adverse Impact on Site Integrity
AFWG	Ashdown Forest Working Group
ALS	Abstraction Licence Strategy
APIS	Air Pollution Information System
AQC	Air Quality Consultants
AQR	Air Quality Report
BCT	Bat Conservation Trust
CAMS	Catchment Abstraction Management Strategy
CIEEM	Chartered Institute of Ecology and Environmental Management
CJEU	Court of Justice of the European Union
CSZ	Core Sustenance Zone
DfT	Department for Transport
DMRB	Design Manual for Roads and Bridges
DTA	David Tyldesley and Associates
EEC	European Economic Community
EP	Environmental Permit
EU	European Union
EUNIS	European Nature Information System
GIS	Geographic Information System
ha	Hectares
HDV	Heavy Duty Vehicles
HRA	Habitats Regulations Assessment
IAQM	Institute of Air Quality Management
IRZ	Impact Risk Zone
IUCN	International Union for Conservation of Nature
JNCC	Joint Nature Conservation Committee
LCWIP	Local Cycling and Walking Infrastructure Plan
LDF	Local Development Framework
LPA	Local Planning Authority
LSE	Likely Significant Effect
N	Nitrogen
NE	Natural England
NO_2	Nitrogen Dioxide

NOx	Nitrogen Oxides
NPPF	National Planning Policy Framework
NPPG	National Planning Practice Guidance
OAHN	Objectively Assessed Housing Need
PRoW	Public Right of Way
RBMP	River Basin Management Plan
RSPB	Royal Society for the Protection of Birds
SAC	Special Area of Conservation
SAMMS	Strategic Access Management and Monitoring Strategy
SDNPA	South Downs National Park Authority
SIP	Site Improvement Plan
SOCG	Statement of Common Ground
SPA	Special Protection Area
SPZ	Source Protection Zone
SSSI	Site of Special Scientific Interest
SuDS	Sustainable Urban Drainage
UK	United Kingdom
WwTW	Waste Water Treatment Works
WCS	Water Cycle Study
WFD	Water Framework Directive
WRMP	Water Resource Management Plan
WRZ	Water Resource Zone

Executive Summary

Introduction

E1. Lepus Consulting has been appointed to undertake a Habitats Regulations Assessment (HRA) of the Crawley Local Plan[1] in compliance with the Habitats Regulations (as amended)[2].

E2. The emerging Crawley Local Plan (2024-2040) will cover the period to 2040. The Local Plan contains draft strategic and non-strategic planning policies and principles to help shape the future of the town. Once adopted, the Local Plan will replace the Crawley Borough Local Plan 2015 - 2030 to provide the basis for future planning decisions in the borough.

E3. This report provides the outputs of the HRA process which has been undertaken alongside preparation of the Local Plan. The report is structured as set out below.

- Section 1: Introduction
- Section 2: Crawley Local Plan
- Section 3: The HRA Process
- Section 4: Methodology
- Section 5: Habitats Sites
- Section 6: Scoping of Impact Pathways
- Section 7: Screening (HRA Stage 1)
- Sections 8 – 12: Appropriate Assessment (HRA Stage 2)
- Section 13: Conclusions and Next Steps

Habitats Regulations Assessment

E4. When preparing development plan documents, councils are required by law to carry out an HRA to test if a plan could significantly harm the designated features of a Habitats site[3]. Depending on the outcomes of the assessment, the Competent Authority (in this instance the Council) can decide whether to adopt the plan[4].

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[1] Crawley Borough Council. Crawley Local Plan. Draft Crawley Borough Local Plan 2024 – 2040. For Submission Publication Consultation.

[2] The Conservation of Habitats and Species Regulations 2017 SI No. 2017/1012, TSO (The Stationery Office), London. Available at: https://www.legislation.gov.uk/uksi/2017/1012/contents [Date Accessed: 14/12/22] as amended by The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. Available at: https://www.legislation.gov.uk/ukdsi/2019/9780111176573 [Date Accessed: 14/12/22]

[3] Habitats site: Any site which would be included within the definition at regulation 8 of the Conservation of Habitats and Species Regulations 2017.

[4] Government Guidance, Habitats Regulations Assessment: Protecting a European site. Available at: https://www.gov.uk/guidance/habitats-regulations-assessments-protecting-a-european-site [Date Accessed: 13/01/23]

E5. In the Crawley Local Plan HRA, Habitats sites include Special Areas of Conservation (SAC), Special Protection Areas (SPA) and Ramsar sites[5].

E6. The HRA process comprises a number of distinct stages of assessment as set out below. This HRA report summarises the outcomes of Stage 1 and Stage 2 only. A process of scoping is used to identify and understand all potential Habitats sites to be included in the HRA.

- Stage 1. Screening: The Local Plan is first screened to determine whether it has the potential to have a likely significant effect (LSE) on a Habitats Site, either on its own or in-combination with other plans and projects. Where LSESs are identified, the Local Plan must progress to Stage 2 of the HRA process – Appropriate Assessment. Where no LSEs are identified, the Local Plan can be adopted in compliance with the Habitats Regulations.
- Stage 2. Appropriate Assessment and the 'Integrity Test': An Appropriate Assessment is undertaken to determine whether or not the Local Plan would have an impact on the integrity of any Habitats site. This assessment is made by the Competent Authority (in this instance the Council) taking into consideration the outputs of this HRA report. The Appropriate Assessment comprises an impact assessment and evaluation in view of a Habitats site's conservation objectives. Where adverse impacts on site integrity are identified, consideration is given to avoidance and mitigation measures which are tested through the assessment process.
- Stage 3. Alternative solutions; and Stage 4. Imperative reasons of overriding public interest and compensatory measures: Stages 3 and 4 relate to the tests of derogation. Under circumstances when it is not possible to pass the integrity test due principally to the Appropriate Assessment concluding that there will be a significant adverse residual effect arising from the plan, it is next necessary to consider if the plan would qualify for an exemption under the Habitats Regulations. Steps 3 and 4 have not been undertaken for the Crawley Local Plan HRA.

Scoping Outcomes

E7. The Scoping process identified how the Local Plan may affect any Habitats site within a pre-defined area of search. Consideration was given to potential links or causal connections between the effects of the Local Plan and Habitats sites within a study area. This exercise was undertaken through the collation of information for each Habitats site and application of a 'source-pathway-receptor' model. Figure N.1 illustrates the impact pathways that were identified as having the potential to affect a number of Habitats sites in the study area.

E8. The following Habitats sites were identified through the scoping process:

- Arun Valley Ramsar
- Arun Valley SAC

[5] Wetlands of international importance (both listed and proposed).

- Arun Valley SPA
- Ashdown Forest SAC
- Ashdown Forest SPA
- Mole Gap to Reigate Escarpment SAC
- South West London Waterbodies Ramsar
- South West London Waterbodies SPA
- The Mens SAC

Mole Gap to Reigate Escarpment SAC
- Change in air quality
- Hydrological change (water abstraction, water levels and water pollution)

Ashdown Forest SAC and SPA
- Change in air quality

South West London Waterbodies SPA and Ramsar
- No pathways of impact between the Local Plan and qualifying site features

Arun Valley SAC, SPA and Ramsar
- Hydrological change (water abstraction, water levels and water pollution)

The Mens SAC
- Impacts on functionally linked land (knock on hydrological impacts)

Figure N.1: Summary of Local Plan impact pathways to the relevant Habitats sites

Screening Outcomes (HRA Stage 1)

E9. The Local Plan is not directly connected with or necessary to the management of any Habitats site. A screening assessment was therefore undertaken which identified a number of LSEs associated with Local Plan policies (as set out in Box N.1). These policies were screened into the HRA process as they have the potential to have an LSE either alone or in combination, or because they provide a case-specific policy intended to avoid or reduce harmful effects at a Habitats site.

E10. Taking no account of mitigation measures, the screening stage concluded that the Local Plan had the potential to affect those Habitats sites set out in Figure N.1., therefore triggering the requirement to undertake the next stage of the HRA process - Appropriate Assessment.

Box N.1: Local Plan components screened into the HRA process for further assessment in an Appropriate Assessment
• Policy EC1: Sustainable Economic Growth • Policy EC4: Strategic Employment Provision • Policy TC3: Town Centre Key Opportunity Sites • Policy H1: Housing Provision • Policy H2: Key Housing Sites • Policy H8: Gypsy, Traveller and Travelling Showpeople Sites • Policy SDC4: Water Neutrality

Appropriate Assessment Outcomes (HRA Stage 2)

Ashdown Forest SAC Air Quality Appropriate Assessment

E11. The HRA provided an assessment of the effects of a change in air quality due to Local Plan development on the site integrity of Ashdown Forest SAC. The qualifying features of Ashdown Forest SPA are the breeding populations of Dartford Warbler and Nightjar. These species of bird depend upon the heathland habitat which is covered by the SAC designation and, as such, the air quality Appropriate Assessment focused on the qualifying features of the SAC.

E12. The Appropriate Assessment drew on air quality modelling which looked at the change in a number of pollutants including nitrogen oxides, ammonia, nitrogen deposition and acid deposition for the Local Plan alone and in-combination. The assessment applied a step-wise approach. This included a detailed analysis against critical levels and loads at receptors along each road link across a number of scenarios, taking into consideration specific habitat types.

E13. The modelling data indicated that nitrogen oxides and ammonia would not have a direct toxic effect on the qualifying habitat types However, their contribution to nitrogen and acid deposition was considered in more detail.

E14. The level of nitrogen deposition from the Local Plan alone at all receptors, except for the A22/A275 junction, the A275 and the A26 at the Poundgate and A22 Little Birch Wood transects, was shown to be below the 1% screening threshold and was therefore considered to be so small as to be insignificant. A review of qualifying habitat indicated that there is no qualifying habitat within areas of exceedance, with the exception of the A275. The impact of this exceedance was considered in the context of habitat types and sensitivities of these habitats to small increments of atmospheric nitrogen deposition (above the critical load) and impacts upon species richness and composition.

E15. As a result of the identified exceedance, it was necessary to analyse mechanisms to reduce traffic related sources of atmospheric emissions. The assessment therefore took into consideration the strong sustainable transport and active travel policies in the Local Plan, local initiative and the county transport plan which also promote sustainable transport options. Taking into consideration the small contribution of the Local Plan to in-combination nitrogen deposition levels at the A275, the small impact of the Local Plan alone on species richness at the A275, background trends which show an improvement in deposition levels and policy provisions to address the Local Plan’s contribution to any in-combination impact, it was concluded that there will be no impact at the SAC in relation to nitrogen deposition caused by the Local Plan either alone or in combination.

E16. In terms of acid deposition, the modelling showed that there would be a small increase along the A275 and A26. A review of habitat mapping data indicated that there is no qualifying habitat present within these areas, that the contribution of the Local Plan to the overall acid deposition level is zero and there is an overall forecast improvement in acid deposition at the SAC. It was therefore concluded that there will be no impact at the SAC in relation to acid deposition caused by the Local Plan either alone or in combination.

E17. In summary, a conclusion of no adverse impact on site integrity was made as a result of changes in air quality due to the Local Plan at Ashdown Forest SAC and SPA.

Mole Gap to Reigate Escarpment SAC Air Quality Appropriate Assessment

E18. European dry heaths, natural box scrub, dry grasslands and scrublands on chalk or limestone, beech forest, yew dominated woodland and the Bechstein's bat qualifying features were all identified as being vulnerable to air pollution, and in particular nitrogen deposition.

E19. The air quality modeling showed that nitrogen oxide and ammonia critical levels were not exceeded for the Local Plan alone or in-combination, and direct toxicity would therefore not have an LSE on the qualifying features of the SAC. Their contribution to nitrogen and acid deposition was however given further consideration in the Appropriate Assessment to allow a habitat specific assessment of potential impacts associated with emissions.

E20. As with Ashdown Forest SAC, the Appropriate Assessment took into consideration habitat types and responses to exceedances of nitrogen deposition. The modelling data indicated there would be an overall reduction in nitrogen deposition levels when comparing the 2015 baseline condition to the modelled 2035 do nothing scenario. This was the case for all transects and receptors, with the exception of a number along the A217 where there would be a small in-combination increase in nitrogen deposition levels attributable to the Local Plan. As such the Appropriate Assessment took into consideration the mitigating effect of Local Plan policies alongside local and county-led initiatives to reduce traffic related atmospheric emissions. Given the small contribution of the Local Plan to in-combination nitrogen deposition levels at the A217, the small impact of the Local Plan alone on species richness at the A217, background trends which show an improvement in deposition levels and when taking into consideration the policy provisions to address the Local Plan's contribution to any in-combination impact, it was concluded there would be no in-combination effect associated with nitrogen deposition at the SAC caused by the Local Plan alone or in combination.

E21. In summary, a conclusion of no adverse impact on site integrity was made as a result of changes in air quality due to the Local Plan at Mole Gap to Reigate Escarpment SAC.

Mole Gap to Reigate Escarpment SAC Water Quality Appropriate Assessment

E22. Water quality and quantity were identified as a threat to the 'Dry heaths' and 'Great Crested Newt' qualifying features of Mole Gap to Reigate Escarpment SAC.

E23. The Council commissioned a number of studies related to the issue of serious water stress and water supply, including a Water Cycle Study (WCS)[6,7]. Water quality modelling was undertaken as part of the WCS. This focused on the discharge of effluent from Wastewater Treatment Works (WwTW) as a result of development to identify potential negative impacts on the quality of the receiving watercourse. Under the WFD, a watercourse is not allowed to deteriorate from its current WFD classification (either as an overall watercourse or for

[6] JBA. August 2020. Gatwick Sub-Region Water Cycle Study. Final Report August 2020. Available at: https://crawley.gov.uk/planning/planning-applications/you-apply/water-neutrality-crawley [Date Sourced: 22/12/22]

[7] JBA. January 2021. Crawley Borough Council Addendum to the Water Cycle Study. Final Report January 2021. Available at: https://crawley.gov.uk/planning/planning-applications/you-apply/water-neutrality-crawley [Date Sourced: 22/12/22]

individual elements assessed). The phosphate concentration in the River Mole at the downstream extent of the Horley to Horsham reach was used to estimate the deterioration in water quality at the SAC. The model predicted there would be no deterioration in the River Mole in this reach from growth within the Gatwick Sub-region. Deterioration in water quality was predicted to be less than 10% and would not result in a change in WFD class. It noted that improvements in treatment processes at WwTWs upstream would allow an improvement in water quality should it be required to offset growth.

E24. Water companies divide their supply into Water Resource Zones (WRZs). Crawley north lies within the SES Water East Surrey WRZ, with Crawley lying with the Southern Water Sussex North WRZ and South East Crawley within the South East Water Haywards Heath WRZ. All three WRZs in the study area are classed as being under serious water stress with a number of deficits identified over the plan period. It is considered that water supply issues to the Thames River Basin District Area and the River Mole management catchment will be addressed through the higher-level water planning framework (WRMP and CAMS). The Local Plan also contains water efficacy requirements under Policy SDC3 – Tackling Water Stress) which will reduce water demand associated with the Local Plan.

E25. Taking into consideration the modelling results, the regulatory framework and policy requirements, it was concluded there will be no adverse impacts on site integrity at the Mole Gap to Reigate Escarpment SAC due to a change in water quality and quantity as a result of the Local Plan either alone or in combination.

Arun Valley SAC, Arun Valley SPA and Arun Valley Ramsar Water Quality Appropriate Assessment

E26. As noted in Paragraph E24, Crawley north lies within WRZs which are classed as being under serious water stress. Natural England provided a position statement in September 2021 to affected Local Planning Authorities (LPAs) regarding potential applications within the Sussex North WRZ. This was followed up with an advice note regarding water neutrality in February 2022[8]. These note that the Sussex North WRZ supplies from a groundwater abstraction point (at Pulborough) which cannot, with certainty, conclude no adverse effect on site integrity at the Arun Valley SAC, Arun Valley SPA and Arun Valley Ramsar site. In particular, Natural England believes that the ongoing abstraction is having a detrimental impact on a number of designated sites including Amberley Wild Brooks SSSI and Pulborough Brooks SSSI. These form part of Arun Valley SPA, Arun Valley SAC and Arun Valley Ramsar site.

E27. As it cannot be concluded that the existing abstraction within the Sussex North Water Supply Zone is not having an impact on these designated sites, Natural England has advised that developments within this zone must not add to this impact. Case law indicates that, where there are known adverse effects upon a Habitats site, a plan or project must demonstrate with certainty that it will not contribute further to these effects[9].

[8] https://crawley.gov.uk/planning/planning-applications/you-apply/water-neutrality-crawley

[9] Ruling of CJEU Coöperative Mobilisation case; Joined cases C-293/17 and C-294/17 (often referred to as the Dutch Nitrogen cases). C-293/17 and C-294/17 Judgment of the Court (Second Chamber) of 7 November 2018 in Coöperatie Mobilisation for the Environment UA and Vereniging Leefmilieu v College van gedeputeerde staten van Limburg and College van gedeputeerde staten van Gelderland. Requests for a preliminary ruling from the Raad van State. http://curia.europa.eu/juris/liste.jsf?language=en&num=C-293/17

E28. Developments within the Sussex North WRZ set out in the Local Plan must therefore not add to this impact. Natural England indicate that one way of achieving this is to demonstrate water neutrality. Water neutrality is defined in the WCS as *'For every new development, total water use in the region after the development must be equal to or less than the total water-use in the region before the new development.'*

E29. In response to this, the Council, alongside other affected LPAs, has prepared a strategy to ensure development set out within the Local Plan will be water neutral. The strategy achieves demand reduction through ambitious water efficiency standards which will be secured through Local Plan Policy SDC3 – Tackling Water Stress and Policy SDC4: Water Neutrality. New residential development within the WRZ must achieve a water efficiency target of 85 litres per person per day and new non-domestic development must achieve a score of three credits within the water (Wat 01 Water Consumption) issue category for the BREEAM New Construction Standard. In addition, it is noted that part of the current Southern Water WRMP (WRMP19) is a strategy to reduce water demand on the network through a reduction in household per capita consumption and a reduction in leakage. This will effectively offset part, but not all, of the growth proposed within Local Plan (alone and in-combination). All developments in the Sussex North WRZ will then need to offset any residual water use and be water neutral, this is a requirement of Policy SDC4: Water Neutrality.

E30. To fully deliver the Water Neutrality Strategy, there will also be an LPA-led Scheme to provide water offsetting for development situated in the Sussex North WRZ. Priority of access to offsetting delivered through the LPA-led Offsetting Scheme will be given to sites allocated in Local Plans and/or identified in the associated, published Local Plan housing trajectories (for example an allowance for Windfall). The offsetting scheme has demonstrated its ability to achieve water neutrality through outputs of a trial study in Crawley. It will ensure water neutrality for all development located in the Sussex North WRZ which will come forward through the Local Plan and will be secured through Policy SDC4: Water Neutrality.

E31. Mitigation required through Local Plan policy for water efficiently measures and the LPA-led water neutrality off-setting scheme will ensure development in the Local Plan will achieve water neutrality. Exact details regarding the delivery mechanism for this project will be further defined in due course and prior to Local Plan adoption. The water neutrality scheme which is secured through planning policy will ensure no impacts take place at the Arun Valley SAC, SPA and Ramsar site as a result of the Local Plan either alone or in-combination in terms of water levels.

E32. The water quality modelling undertaken as part of the WCS[10] indicated that no WwTW serving the Crawley area will discharge to the Arun catchment. As such it can be concluded there will be no impact on site integrity from water quality at the Arun Valley SAC, SPA or Ramsar as a result of discharges from the Plan area.

E33. In conclusion, taking into consideration the outputs of the water quality modelling and water neutrality strategy secured in the Local Plan, it is considered that the Local Plan will

[10] Natural England. 2014. Site Improvement Plan. Arun Valley SPA and SCI. Available at: http://publications.naturalengland.org.uk/file/5185212862431232. Sourced: 08/09/20.

have no adverse impact on site integrity either alone or in-combination at the Arun Valley SAC, SPA or Ramsar in terms of water impacts.

The Mens SAC Functionally Linked Land Appropriate Assessment

E34. Barbastelle Bats are a qualifying feature of the Mens SAC. Potential adverse impacts upon water quality and water quantity in the Arun Valley have the potential to result in a change to or loss of foraging habitat outside the SAC designation boundary. Poor water quality or inadequate quantities of water can adversely affect the structure and function of such wetland habitats and therefore the extent of foraging areas for the Barbastelle Bat which have been identified to extend up to 7km from their roost sites within the floodplain of the River Arun. This may have an indirect impact upon this qualifying feature and the conservation objectives of the SAC by limiting the range and / or quality of foraging habitat.

E35. The water quality modelling undertaken as part of the WCS indicates that no WwTW serving the Crawley area will discharge to the Arun catchment. As such it can be concluded there will be no adverse effects from a change in water quality on foraging habitat used by the Barbastelle Bat.

E36. Mitigation required through Local Plan policy for water efficiency measures and the LPA-led water neutrality off-setting scheme will ensure development in the Local Plan will achieve water neutrality. This will ensure no adverse effects on water levels at the Arun Valley from the Local Plan either alone or in-combination and therefore no indirect on the qualifying features of the SAC.

E37. Taking into consideration the outputs of the water quality modelling and water neutrality strategy secured in the Local Plan, it is considered that the Local Plan will have no adverse effects on water quality or levels in the Arun Valley or the qualifying features of the Mens SAC either alone or in-combination.

Conclusion

E38. The Local Plan is not directly connected with or necessary to the management of any Habitats site. A screening assessment identified a number of LSEs associated with the Local Plan. Taking no account of mitigation measures these had the potential to affect the following Habitats sites:

- Ashdown Forest SAC and SPA – air quality;
- Mole Gap to Reigate Escarpment SAC – air quality and hydrology;
- Arun Valley SAC – hydrology;
- Arun Valley SPA – hydrology;
- Arun Valley Ramsar – hydrology; and
- The Mens SAC – impacts on areas of functionally linked land.

E39. The HRA therefore progressed to an Appropriate Assessment which looked at the impacts of a change in air quality, water quality and quantity and impacts upon functionally linked land upon the qualifying features and conservation objectives of each Habitats site.

E40. The Appropriate Assessment has taken into consideration the outputs of detailed air quality modelling and water quality modelling to inform the conclusions of the Appropriate Assessment. Planning policy has also been informed by a piece of work that was commissioned by the Council and other affected LPAs within the Sussex North WRZ to ensure all Local Plans (both alone and in-combination) will achieve water neutrality. Required mitigation is secured through policies within the Local Plan itself and through the wider environmental protection framework.

E41. On the basis of the Appropriate Assessment, the HRA concludes that the Local Plan would have no adverse impact on site integrity at any Habitats site, either alone or in-combination. Table N.1 provides a high-level summary of the HRA process.

Table N.2: *Summary of Local Plan HRA outputs*

Qualifying Features which may be affected by Local Plan (alone or in-combination)	Impact Pathways from Local Plan	Supporting Appropriate Assessment information	Mitigation measures applied	Adverse impact on site integrity (AIOSI)?
Ashdown Forest SAC Northern Atlantic wet heaths with *Erica tetralix*; Wet heathland with cross-leaved heath European dry heaths	Change in air quality – direct impact upon habitats.	Air quality Modelling.	Local Plan, local sustainable travel initiatives and the County Transport Plan.	No AIOSI
Ashdown Forest SPA European nightjar (Breeding) Dartford warbler (Breeding)	Change in air quality – indirect impact upon species habitat requirements.	Air quality Modelling.	Local Plan, local sustainable travel initiatives and the County Transport Plan.	No AIOSI
Mole Gap to Reigate Escarpment SAC European dry heaths Stable xerothermophilous formations with Buxus sempervirens on rock slopes, Natural box scrub Semi-natural dry grasslands and scrubland facies: on calcareous substrates (important orchid sites), Dry grasslands and scrublands on chalk or limestone (important orchid sites) *Asperulo-Fagetum* beech forests; Beech forests on neutral to rich soils *Taxus baccata* woods of the British Isles; Yew-dominated woodland Great crested newt Bechstein`s bat	Change in air quality – direct impact upon habitat types and indirect impacts on species habitat requirements. Water quality and water quantity impacts through hydrological linkage.	Air quality Modelling Water quality modelling.	Local Plan, local sustainable travel initiatives and the County Transport Plan. Policy wording around water efficiency (Policy SDC3 – Tackling Water Stress).	No AIOSI No AIOSI
Arun Valley SAC Little whirlpool ram's-horn snail	Water quality and water quantity direct impacts through hydrological linkages.	Water quality modelling	Policy wording around water efficiency (Policy SDC4: Water Neutrality and Policy SDC3: Tackling Water Stress)	No AIOSI

Qualifying Features which may be affected by Local Plan (alone or in-combination)	Impact Pathways from Local Plan	Supporting Appropriate Assessment information	Mitigation measures applied	Adverse impact on site integrity (AIOSI)?
Arun Valley SPA Bewick's swan (Non-breeding) Waterbird assemblage (including: Shoveler, Teal, Wigeon, Bewick's Swan).	Indirect water quality and water quantity impacts on species habitat requirements through hydrological linkages.	Water quality modelling	Policy wording around water efficiency (Policy SDC4: Water Neutrality and Policy SDC3: Tackling Water Stress)	No AIOSI
Arun Valley Ramsar Red Data Book invertebrate and plant species. Assemblages of waterbirds of international importance. Species/populations identified subsequent to designation for possible future consideration under criterion 6 – Northern pintail	Water quality and water quantity direct and indirect impacts through hydrological linkages.	Water quality modelling	Policy wording around water efficiency (Policy SDC4: Water Neutrality and Policy SDC3: Tackling Water Stress)	No AIOSI
The Mens SAC Barbastelle bat	Impacts on functionally linked bat habitat through hydrological changes.	Water quality modelling	Policy wording around water efficiency (Policy SDC4: Water Neutrality and Policy SDC3: Tackling Water Stress)	No AIOSI

1 Introduction

1.1 HRA of the Crawley Local Plan

1.1.1 The Crawley Borough Council Local Plan, Crawley 2030[11], was adopted in December 2015. It forms the Council's development plan and sets the planning policies under which development management decisions are taken.

1.1.2 Crawley Borough Council (hereafter referred to as the Council) is currently reviewing the adopted Local Plan to ensure it takes into consideration an emerging technical evidence base, national legislation, revisions to the National Planning Policy Framework (NPPF)[12] and National Planning Practice Guidance (NPPG)[13]. Many of the proposed developments identified and allocated through the adopted Local Plan, Crawley 2030, will be continued in the new Local Plan[14].

1.1.3 Lepus Consulting has prepared this report on behalf of the Council to inform the Habitats Regulations Assessment (HRA) of the Submission Publication Consultation version of the Local Plan (referred to hereafter as the 'Local Plan')[15]. The Local Plan will cover the period from 2024 to 2040 and extends across the whole of the Council's administrative area (referred to hereafter as the 'Plan area' and illustrated in Figure 1.1).

[11] Crawley Borough Council. December 2015. Crawley 2030. Crawley Borough Council Local Plan. 2015 – 2030.

[12] Ministry of Housing, Communities & Local Government (2019) National Planning Policy Framework. Available at: https://www.gov.uk/government/publications/national-planning-policy-framework--2 [Date Accessed: 14/12/22]

[13] National Planning Practice Guidance. Available at: https://www.gov.uk/government/collections/planning-practice-guidance [Date Accessed: 14/12/22]

[14] Crawley Borough Council. September 2020. Draft Crawley Borough Local Plan 2021 – 2036. For Submission Publication Consultation: November – December 2020

[15] Crawley Borough Council. Crawley Local Plan. Draft Crawley Borough Local Plan 2024 – 2040. For Submission Publication Consultation.

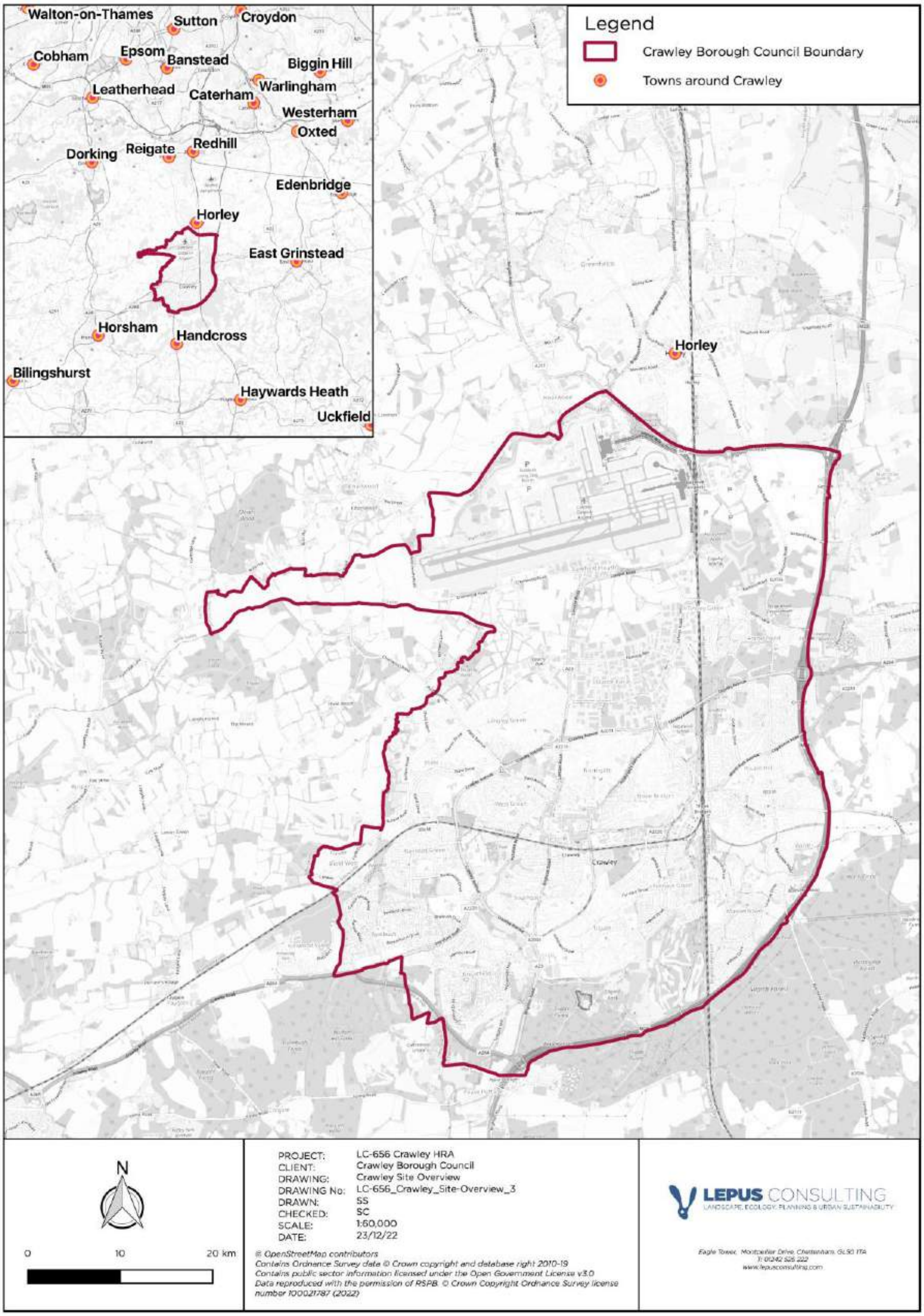

Figure 1.1: Local Plan area

1.2 Purpose of this report

1.2.1 The HRA has been prepared in accordance with the Conservation of Habitats and Species Regulations 2017 (as amended)[16], known as the Habitats Regulations. When preparing development plan documents, councils are required by law to carry out an HRA. The requirement for authorities to comply with the Habitats Regulations when preparing a Local Plan is also noted in the Government's online planning practice guidance[17].

1.2.2 The purpose of this report is to inform the HRA of the Local Plan using best available information. The Council, as the Competent Authority, will have responsibility to make the Integrity Test. This can be undertaken in light of the conclusions set out in this report, having regard to representations made by Natural England under the provisions of Regulations 63(3) and 105(2) of the Habitats Regulations.

[16] The Conservation of Habitats and Species Regulations 2017 SI No. 2017/1012, TSO (The Stationery Office), London. Available at: https://www.legislation.gov.uk/uksi/2017/1012/contents [Date Accessed: 14/12/22] as amended by The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. Available at: https://www.legislation.gov.uk/ukdsi/2019/9780111176573 [Date Accessed: 14/12/22]

[17] Ministry of Housing, Communities and Local Government (July 2019) Planning Practice Guidance Note, Appropriate Assessment, Guidance on the use of Habitats Regulations Assessment

2 Crawley Local Plan

2.1 Crawley Local Plan Review

2.1.1 The emerging Crawley Local Plan (2024-2040) will cover the period to 2040. The Local Plan contains draft strategic and non-strategic planning policies and principles to help shape the future of the town. Some of the Policies are proposed to be retained from the existing Local Plan (2015-2030), others have been changed, and some new policies are being proposed. The Local Plan sets out the strategic priorities for Crawley and the planning policies to deliver the following:

- Homes and jobs;
- Provision of retail, leisure and other commercial development;
- Provision of infrastructure for transport, telecommunications, water supply, wastewater, flood risk management, and energy;
- Provision of community, social and cultural infrastructure and other local facilities;
- Climate change mitigation and adaptation;
- Conservation and enhancement of the natural, built and historic environment, including landscape and green infrastructure; and
- Control of Gatwick Airport.

2.1.2 Once adopted, the Local Plan will replace the Crawley Borough Local Plan 2015 - 2030 to provide the basis for future planning decisions in the borough.

2.2 Background to the Local Plan development

2.2.1 In 2019, the Council undertook an exercise of early engagement through the consultation version of the Regulation 18 draft Local Plan[18]. It set out emerging draft strategic and non-strategic planning policies and principles to help shape the future of the town. It also set out a series of consultation questions at the start of each topic chapter, and more detailed questions after each Policy upon which consultation was sought.

2.2.2 Consultation on a Publication (Submission) draft of the Local Plan was undertaken between January and March 2020[19]. This document took into consideration the evidence produced in support of the Local Plan and also findings from the Regulation 18 stage of consultation. This stage was repeated due to updated evidence, changes in national policy and guidance from the Planning Inspectorate. The Council consulted on an additional round of Regulation 19 consultation – the Local Plan Additional (Submission) consultation from January to June 2021.

[18] Crawley Borough Council. 2019. Draft Crawley Borough Local Plan 2020 – 2035 June 2019 For Early Engagement Consultation July – September 2019.

[19] Crawley Borough Council. 2020. Crawley 2035. Draft Crawley Borough Local Plan 2020 – 2035 January 2020 For Submission Publication Consultation: January – March 2022

2.2.3 Following the 2021 Regulation 19 consultation, Natural England notified affected Local Planning Authorities (LPAs) that developments within the Sussex North water supply area must not add to impacts on protected nature conservation sites and must ensure that they are 'water neutral'. The implications of this advice have since been incorporated into the most recent version of the Local Plan[20].

[20] https://crawley.gov.uk/planning/planning-applications/you-apply/water-neutrality-crawley

3 The HRA process

3.1 Overview

3.1.1 The HRA process is used to assess the potential effects of a plan or project on the conservation objectives of sites designated under the Habitats[21] and Birds[22] Directives. These sites form a system of internationally important sites throughout Europe known collectively as the 'Natura 2000 Network'.

3.1.2 The Habitats Regulations[23] provide a definition of a European site at Regulation 8. These sites include Special Areas of Conservation (SAC), Sites of Community Importance, Special Protection Areas (SPA) and sites proposed to the European Commission in accordance with Article 4(1) of the Habitats Directive. Following Brexit, UK sites which were part of the Natura 2000 Network before leaving the EU have become part of the National Site Network.

3.1.3 In addition, policy in England and Wales notes that the following sites should also be given the same level of protection as a European site[24]. European sites, together with sites set out in national policy (listed below), are referred to in England and Wales as a Habitats site[25]. These include:

- A potential SPA (pSPA);
- A possible / proposed SAC (pSAC);
- Listed and proposed Ramsar Sites (Wetland of International Importance); and
- In England, sites identified or required as compensation measures for adverse effects on statutory Habitats sites, pSPA, pSAC and listed or proposed Ramsar sites.

[21] Official Journal of the European Communities (1992). Council Directive 92 /43 /EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora.

[22] Official Journal of the European Communities (2009). Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds.

[23] Conservation of Habitats and Species Regulations 2017 SI No. 2017/1012, TSO (The Stationery Office), London. Available at: https://www.legislation.gov.uk/uksi/2017/1012/contents [Date Accessed: 14/12/22] as amended by The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. Available at: https://www.legislation.gov.uk/ukdsi/2019/9780111176573 [Date Accessed: 14/12/22]

[24] Ministry of Housing, Communities & Local Government (2021). National Planning Policy Framework. Para 181. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/810197/NPPF_Feb_2019_revised.pdf [Date Accessed: 14/12/22]

[25] Habitats site: Any site which would be included within the definition at regulation 8 of the Conservation of Habitats and Species Regulations 2017 for the purpose of those regulations, including candidate Special Areas of Conservation, Sites of Community Importance, Special Areas of Conservation, Special Protection Areas and any relevant Marine Sites. Ministry of Housing, Communities & Local Government (2021). National Planning Policy Framework. Para 181. Available in Annex 2 (Glossary) at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/810197/NPPF_Feb_2019_revised.pdf [Date Accessed: 14/12/22]

3.1.4 HRA applies to plans or projects which are likely to have a significant effect on a Habitats site (either alone or in combination with other plans or projects), and / or not directly connected with or necessary to the management of that site. Determination of likely significant effects is determined via a process known as 'screening'.

3.1.5 It is a requirement of Regulation 63 of the Habitats Regulations that a competent authority, before deciding to undertake, or give any consent, permission or other authorisation for a plan or project, must make an appropriate assessment of the implications of the plan or project for that site in view of its site conservation objectives. These tests (screening and appropriate assessment) are referred to collectively as a Habitats Regulations Assessment (HRA).

3.1.6 There is no set methodology or specification for carrying out and recording the outcomes of the assessment process. The Habitats Regulations Assessment Handbook, produced by David Tyldesley Associates (referred to hereafter as the 'DTA Handbook'), provides an industry recognised good practice approach to HRA. The DTA Handbook, and in particular 'Practical Guidance for the Assessment of Plans under the Regulations'[26], which forms part F, has therefore been used to prepare this report, alongside reference to Government Guidance on Appropriate Assessment[27].

3.1.7 A step-by-step guide to the methodology adopted in this assessment, as outlined in the DTA Handbook, is illustrated in Figure 3.1.

[26] Tyldesley, D., and Chapman, C. (2013) The Habitats Regulations Assessment Handbook (September) (2013) edition UK: DTA Publications Limited. Available at: www.dtapublications.co.uk

[27] Government Guidance on Appropriate Assessment. July 2019. Guidance on the use of Habitats Regulations Assessment. Available at: https://www.gov.uk/guidance/appropriate-assessment

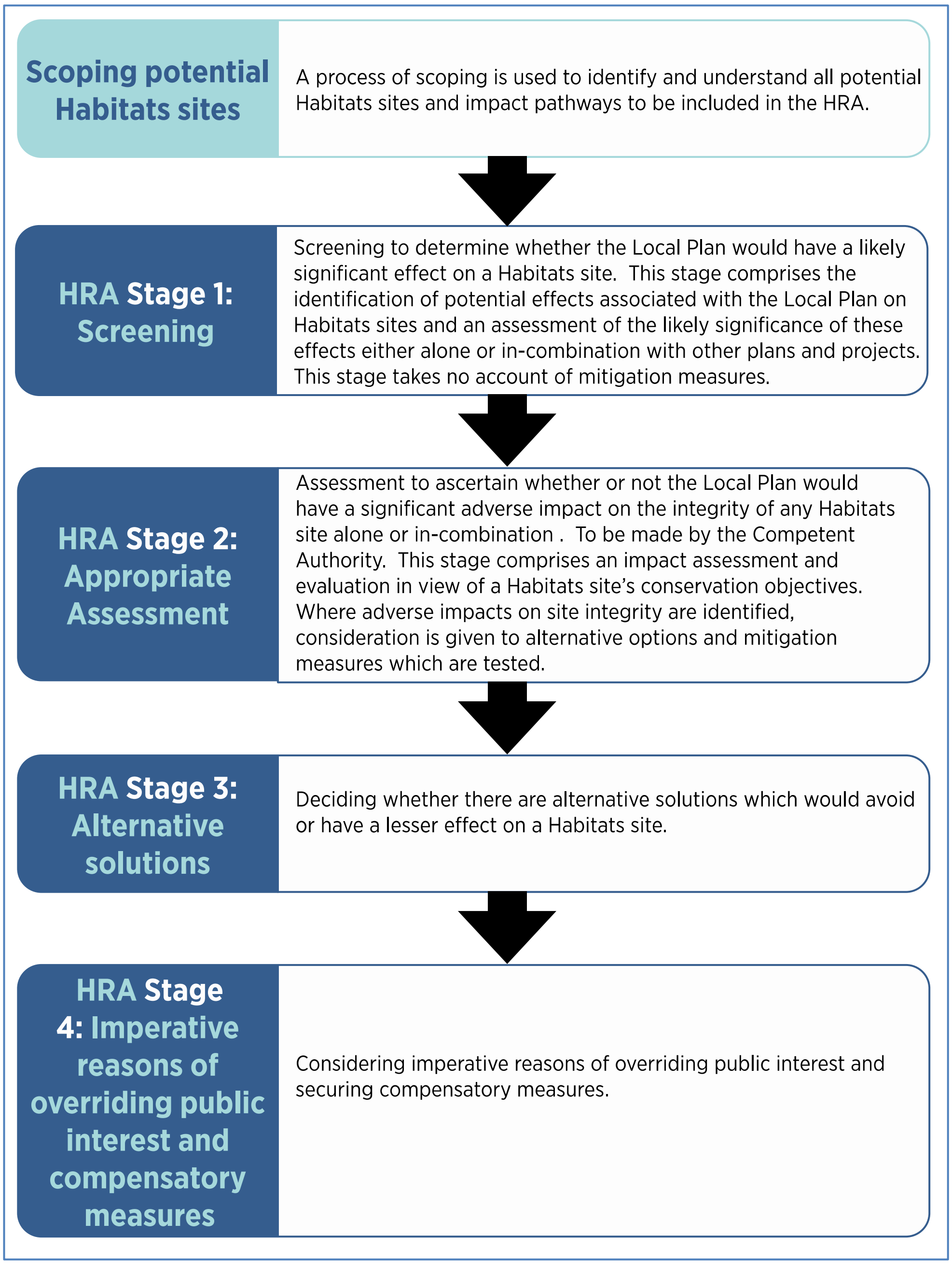

Figure 3.1: Stages in the Habitats Regulations Assessment process[28]

3.2 Previous HRA work

3.2.1 HRA work that has been undertaken to support the emerging Local Plan (2015-2040) is as follows:

- Adopted Local Plan HRA: Habitats Regulations Assessment Screening Report for the Crawley Borough Local Plan Review (Crawley Borough Council, November 2013).
- Local Plan review: Habitats Regulations Assessment Screening Report for the Crawley Borough Local Plan Review (Crawley Borough Council, July 2019); and

[28] Tyldesley, D., and Chapman, C. (2013) The Habitats Regulations Assessment Handbook (October) (2018) edition UK: DTA Publications Limited. Available at: www.dtapublications.co.uk

- Local Plan Review: Habitats Regulations Assessment Screening Report for the Crawley Borough Local Plan Review (Crawley Borough Council, January 2020).
- Local Plan Additional Publication (Submission) consultation. Habitats Regulations Assessment of the Crawley Borough Council Local Plan. Draft. Report to Inform the HRA. (Lepus Consulting, January 2021).

3.2.2 Table 3.1 provides a summary of the HRA work that was undertaken to support the plan making process.

Table 3.1: Summary of Local Plan HRA assessment work

HRA Report	Summary of findings
Local Plan review: Habitats Regulations Assessment Screening Report for the Crawley Borough Local Plan Review Crawley Borough Council July 2019	At Regulation 18, as part of the current Local Plan review, an HRA Screening Report was undertaken to support the emerging draft version of the Plan. This report adopted the same study area as the HRA that was undertaken in support of the Adopted Local Plan (above), focusing on the same Habitats sites and potential impact pathways. This was due to the similarities between the adopted and emerging plan review. LSEs associated with recreational impacts at Mole Valley to Reigate SAC and Ashdown Forest SAC and SPA and hydrology impacts at South West London Waterbodies SPA and Mole Valley to Reigate SAC were screened out on the basis of the rationale set out for the Adopted Local Plan HRA as detailed above. In terms of air quality LSEs at Ashdown Forest SPA and SAC, the Screening Report indicates that there is a need to undertake further investigation to fully understand possible impacts on the Habitats Sites from the Local Plan review both on its own and in combination with other Plans. This is following the Wealden Judgement in respect of in-combination effects, and in light of joint working that has since been undertaken in the Ashdown Forest Authority area through the Ashdown Forest Working Group.
Local Plan Review: Habitats Regulations Assessment Screening Report for the Crawley Borough Local Plan Review Crawley Borough Council January 2020	An HRA Screening Report update was undertaken in January 2020 in support of the previous round Regulation 19 consultation. This drew on the same study area and assessed the same range of LSEs as the Regulation 18 version of the HRA (above). LSEs associated with recreational impacts at Mole Valley to Reigate SAC and Ashdown Forest SAC and SPA and hydrology impacts at South West London Waterbodies SPA and Mole Valley to Reigate SAC were screened out on the basis of the rationale set out for the Adopted Local Plan HRA as detailed above. As above, in light of the Wealden Judgement, in-combination air quality LSEs at Ashdown Forest SPA and SAC were screened in.
Local Plan Additional Publication (Submission) consultation. Habitats Regulations Assessment of the Crawley Borough Council Local Plan. Draft. Report to Inform the HRA. Lepus Consulting January 2021	The HRA report screened in a number of Habitats sites and LSEs for further assessment in an Appropriate Assessment as follows: • Ashdown Forest SAC and SPA – air quality • Mole Gap to Reigate Escarpment SAC – air quality and hydrology • Arun Valley – hydrology • Arun Valley SPA – hydrology • Arun Valley Ramsar – hydrology • The Mens SAC – hydrology (at functionally linked land) The HRA report noted that air quality modelling and hydrological work was ongoing to inform a detailed appropriate assessment and reached no conclusions on these matters.

3.2.3 As part of the statutory public consultation held in January 2020, HRA related representations on the draft HRA Screening Report were received from Mid Sussex District Council, Reigate and Banstead Borough Council and Sussex Ornithological Society. No comments were received from Natural England or the Environment Agency.

3.2.4 Following receipt of the Gatwick Water Cycle Study (WCS), Natural England issued correspondence expanding on their original response on the WCS specifically.

3.2.5 Table 3.2 provides a summary of all responses received to date on the HRA (and WCS) and an indication of how these have been taken into consideration in the assessment process.

Table 3.2: Review of HRA related representations

Organisation	Summary of representation	How this has been taken into consideration in the HRA
Natural England Letter dated 18th September 2019 REP211/950	Natural England indicated its agreement with the findings of the July 2019 HRA Draft HRA Screening Report.	No further action required.
Natural England Letter dated 2nd March 2020 REP/069	Natural England indicated its agreement with the findings of the January 2020 HRA Screening Report.	No further action required.
Natural England Letter dated 28th July 2020	Natural England highlights potential for LSEs associated with water quantity and water quality impacts from the Local Plan on the Arun Valley SAC, SPA and Ramsar and the need to consider these impacts with the Local Plan HRA in more detail. This relates to the requirement to consider the implications of the CJEU's judgment on the Coöperative Mobilisation case[29] (the 'Dutch Nitrogen cases") in terms of water issues from development pressure and reliance on strategic plans for reducing such impacts. In terms of water resource issues, this advice is based on an evidence review of the Pulborough groundwater abstraction, which supplies Southern Water's Sussex North supply area within the Crawley Borough Council area. In terms of water quality, this advice is in relation to a potential deterioration associated with discharges from waste water treatment works (WwTW), which may be exacerbated by additional development pressure.	Detailed assessment work has been undertaken to address NE's concerns in relation to water quantity and water quality impacts from the Local Plan at the Arun Valley SAC, SPA and Ramsar. In addition, ongoing consultations have been undertaken with affected authorities, water companies and NE. The outputs of this work is reported upon in the Appropriate Assessment.
Natural England Response to Submission Publication Consultation: January – February 2021 REP/113	Natural England note previous advice regarding hydrological impacts at the Arun Valley SAC, SPA and Ramsar sites.	As above.

[29] http://curia.europa.eu/juris/liste.jsf?language=en&num=C-293/17

Organisation	Summary of representation	How this has been taken into consideration in the HRA
Natural England 14 September 2021 Position Statement for Applications within the Sussex North Water Supply Zone.	Natural England states that developments within the Sussex North Water Supply Zone must not add to adverse effects of groundwater abstraction at the Arun Valley SAC, SPA and Ramsar site. This is required by recent caselaw, Case C-323/17 People over wind and Sweetman. Ruling of CJEU (often referred to as sweetman II) and Coöperative Mobilisation for the Environment and Vereniging Leefmilieu Case C-293/17 (often referred to as the Dutch Nitrogen cases). They go on to note that water neutrality is one was to demonstrate no adverse impacts. Natural England advises that a strategic approach should be taken across affected LPA areas. They provide an interim approach.	Taken into consideration in the Appropriate Assessment of impacts at the Arun Valley SAC, SPA and Ramsar site.
Natural England Advice Note regarding Water Neutrality within the Sussex North Water Supply Zone: February 2022 V2	Natural England provides advice to expand upon and clarify the Statement issued on 14 September 2021. The advice applies solely to the Sussex North Water Supply Zone.	Taken into consideration in the Appropriate Assessment of impacts at the Arun Valley SAC, SPA and Ramsar site.
Natural England's endorsement of Sussex North Water Neutrality Study: Part C – Mitigation Strategy, Final Report, 23 November 2022	Natural England endorses the strategic mitigation strategy set out in the Sussex North Water Neutrality Study: Part C – Mitigation Strategy.	Taken into consideration in the Appropriate Assessment of impacts at the Arun Valley SAC, SPA and Ramsar site.
Sussex Ornithological Society REP162/566 (Regulation 18 Representation – 14 September 2019)	SOS agrees that an Appropriate Assessment is not required.	No further action required.
Sussex Ornithological Society REP/022 (Regulation 19 Representation – 2 March 2020)	The SOS representation relates to the 5925 houses which will be delivered in neighbouring Local Authority areas under the Duty to Cooperate obligations, as an urban extension adjacent to Crawley's boundaries. Key concerns relate to scarce birds of conservation concern, as well as wider adverse biodiversity impacts.	The HRA has focused specifically upon European designations and their functionally linked land. Impacts on wider biodiversity and landscape features are addressed in the Local Plan Sustainability Appraisal under Sustainability Objective number six (to conserve and enhance the biodiversity habitats, key landscape features and fauna and flora within the borough)[30].

[30] Crawley Borough Council. January 2021. Local Plan Review. Sustainability Appraisal/ Strategic Environmental Assessment. Draft Report for the Submission Local Plan.

Organisation	Summary of representation	How this has been taken into consideration in the HRA
Reigate & Banstead Borough Council REP/058 (Regulation 19 Representation – 2 March 2020)	The Council notes that due to the findings of the Lewes and South Downs Joint Core Strategy 2017 Legal Challenge in relation to how "in-combination" effects are considered that CBC will do further work to understand the possible impacts on the European sites arising from the Regulation 19 Crawley Borough Local Plan and "in-combination" with other plans. In particular, the Council notes that as part of the preparation / examination of their DMP, mitigation measures to protect the foraging habitat referred to as a 'functional linkage' of Bechstein's Bats surrounding the Mole Gap to Reigate Escarpment SAC was taken into consideration.	The HRA has taken into consideration in-combination air quality and hydrology effects taking into consideration the Wealden Judgement and Natural England's current guidance on the assessment of air quality effects[31]. Detailed air quality modelling work has also been informed by the guidance and methodologies set out within the Ashdown Forest Statement of Common Ground (SoCG)[32]. The HRA has taken into consideration the People Over Wind judgement in terms of the consideration of mitigation measures. A review of traffic data in relation to all Habitats sites vulnerable to air quality impacts has been considered as part of the HRA. This has included Ashdown Forest SPA and SAC and also Mole Gap to Reigate Escarpment. Consideration has been given to potential impacts on areas of functionally linked habitat for Bechstein's Bat.
Reigate & Banstead Borough Council REP/058 (Response to Submission Publication Consultation: January – February 2021)	The Council note that the updated HRA takes into consideration their comments provided in March 2020 in relation to Bechstein's Bats. They note that recreational impacts at Mole Gap to Reigate Escarpment SAC must be taken into consideration alongside air quality impacts.	As above. In addition, public access and disturbance at the Mole Gap to Reigate Escarpment SAC has been taken into consideration in the Appropriate Assessment.
Mid Sussex District Council REP/066 (Regulation 19 Representation – 2 March 2020)	Mid Sussex note the following: - The requirement to consider traffic distributions across the whole road network, rather than only considering a defined study area e.g. a 10km study area. - The requirement to consider thresholds both alone and in-combination. - The requirement to consider updated evidence including the Mid Sussex Transport Model (2019) which has been prepared to support preparation of the Mid Sussex Site Allocations DPD.	Air quality screening has been undertaken in line with the requirements of NE's guidance and methodologies set out in the Ashdown Forest SoCG. Detailed air quality modelling work has ensured that all development with the potential to contribute to increased traffic emissions at a Habitats site have been considered in the air quality assessment. This has ensured that the Wealden Judgement is taken into consideration in terms of in-combination thresholds.
Mid Sussex District Council REP/066 (Response to Submission Publication	The Council note that transport modelling, air quality modelling and ecological interpretation will be key to assess impacts on the Ashdown Forest SAC in the HRA.	Detailed transport modelling, air quality modelling and ecological interpretation has been undertaken to inform the Appropriate Assessment.

[31] Natural England (2018) Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations (NEA001). Available at: http://publications.naturalengland.org.uk/publication/4720542048845824 [Date Accessed: 14/12/22]

[32] Ashdown Forest Statement of Common Ground. April 2018.

Organisation	Summary of representation	How this has been taken into consideration in the HRA
Consultation: January – February 2021)		

4 Methodology

4.1 Introduction

4.1.1 As noted in Section 1.2, the application of HRA to land-use plans is a requirement of the Habitats Regulations. HRA applies to plans and projects, including all Local Development Documents in England and Wales.

4.1.2 This report has been informed by the following guidance:

- Planning Practice Guidance: Appropriate Assessment[33]; and
- The Habitat Regulations Assessment Handbook - David Tyldesley and Associates (referred to hereafter as the DTA Handbook), 2013 (in particular Part F: '*Practical Guidance for the Assessment of Plans under the Regulations*').

4.2 HRA methodology

4.2.1 HRA is a rigorous precautionary process centred around the conservation objectives of a Habitats site's qualifying interests. It is intended to ensure that designated Habitats sites are protected from impacts that could adversely affect their integrity. A step-by-step guide to this methodology is outlined in the DTA Handbook and has been reproduced in Figure 3.1.

4.3 Stage 1: Screening for likely significant effects

4.3.1 The first stage in the HRA process comprises the screening stage. The purpose of the screening process is to firstly determine whether a plan is either (1) exempt (because it is directly connected with or necessary to the management of a Habitats site), (2) whether it can be excluded (because it is not a plan), or (3) eliminated (because there would be no conceivable effects), from the HRA process. If none of these conditions apply, it is next necessary to identify whether there are any aspects of the plan which may lead to likely significant effects at a Habitats site, either alone or in combination with other plans or projects.

4.3.2 Screening considers the potential 'significance' of adverse effects. Where elements of the Local Plan will not result in a likely significant effect (LSE) on a Habitats site these are screened out and are not considered in further detail in the process. The screening stage follows a number of steps which are outlined in Figure 4.1.

[33] Ministry of Housing, Communities and Local Government (July 2019) Planning Practice Guidance Note, Appropriate Assessment, Guidance on the use of Habitats Regulations Assessment

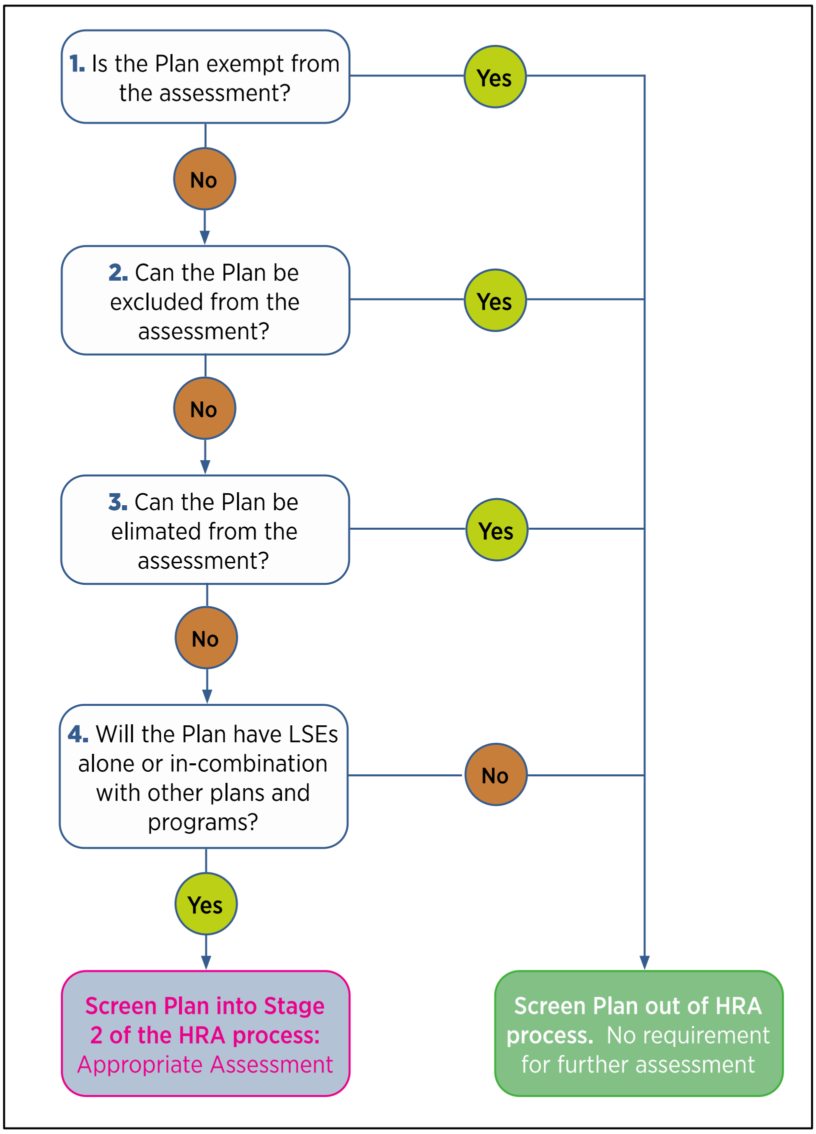

Figure 4.1: Outline of screening process.

4.3.3 The pre-screening process uses a number of evaluation codes to summarise whether or not a plan component is likely to have LSEs alone or in-combination, see Table 4.1, and to inform the formal screening decision.

Table 4.1: Pre-screening assessment and reasoning categories from Part F of the DTA Handbook

Pre-screening assessment and reasoning categories from Chapter F of The Habitats Regulations Assessment Handbook (DTA Publications, 2013):
A. General statements of policy / general aspirations. B. Policies listing general criteria for testing the acceptability / sustainability of proposals. C. Proposal referred to but not proposed by the plan. D. General plan-wide environmental protection / site safeguarding / threshold policies E. Policies or proposals that steer change in such a way as to protect European sites from adverse effects. F. Policies or proposals that cannot lead to development or other change. G. Policies or proposals that could not have any conceivable or adverse effect on a site. H. Policies or proposals the (actual or theoretical) effects of which cannot undermine the conservation objectives (either alone or in combination with other aspects of this or other plans or projects). I. Policies or proposals with a likely significant effect on a site alone. J. Policies or proposals unlikely to have a significant effect alone. K. Policies or proposals unlikely to have a significant effect either alone or in combination. L. Policies or proposals which might be likely to have a significant effect in combination. M. Bespoke area, site or case-specific policies or proposals intended to avoid or reduce harmful effects on a European site.

4.4 What is a Likely Significant Effect?

4.4.1 HRA screening provides an analysis of LSEs identified during the HRA screening process. It considers the nature, magnitude and permanence of potential effects in order to inform the plan making process.

4.4.2 The DTA Handbook guidance provides the following interpretation of LSEs:

4.4.3 *"In this context, 'likely' means risk or possibility of effects occurring that cannot be ruled out on the basis of objective information. 'Significant' effects are those that would undermine the conservation objectives for the qualifying features potentially affected, either alone or in combination with other plans or projects… even a possibility of a significant effect occurring is sufficient to trigger an 'appropriate assessment'."*[34]

4.4.4 With reference to the conservation status of a given species in the Habitats or Birds Directives, the following examples would be considered to constitute a significant effect:

- Any event which contributes to the long-term decline of the population of the species on the site;
- Any event contributing to the reduction, or to the risk of reduction, of the range of the species within the site; and
- Any event which contributes to the reduction of the size of the habitat of the species within the site.

[34] Tyldesley, D. (2013) The Habitats Regulations Assessment Handbook – Chapter F. DTA Publications

4.4.5 Rulings from the 2012 'Sweetman[35]' case provide further clarification:

4.4.6 "*The requirement that the effect in question be 'significant' exists in order to lay down a de minimis threshold. Plans or projects that have no appreciable effect on the site are thereby excluded. If all plans or 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.*"

4.4.7 Therefore, it is not necessary for the Council to show that the Local Plan will result in no effects whatsoever on any Habitats site. Instead, the Council is required to show that the Local Plan, either alone or in-combination with other plans and projects, will not result in an effect which undermines the conservation objectives of one or more qualifying features.

4.4.8 Determining whether an effect is significant requires careful consideration of the environmental conditions and characteristics of the Habitats site in question, as per the 2004 'Waddenzee[36]' case:

4.4.9 "*In assessing the potential effects of a plan or project, their significance must be established in the light, inter alia, of the characteristics and specific environmental conditions of the site concerned by that plan or project*".

4.5 In-combination effects

4.5.1 Where screening concludes there are no LSEs from the Local Plan alone, it is next necessary to consider whether the effects of the policies in-combination with other plans and projects would combine to result in an LSE on any Habitats site. It may be that the Local Plan alone may not have a significant effect but could have a residual effect that may contribute to in-combination effects on a Habitats site.

4.5.2 The DTA Handbook[37] notes that "*where an aspect of a plan could have some effect on the qualifying feature(s) of a European site, but that aspect of the plan alone are unlikely to be significant, the effects of that aspect of the plan will need to be checked in combination firstly, with other effects of the same plan, and then with the effects of other plans and projects*".

4.5.3 As such an in-combination assessment has been undertaken as part of the HRA process at both the screening stage (where no LSE are considered possible alone, but in-combination effects are likely) and also at the Appropriate Assessment stage (where, following Appropriate Assessment and mitigation, an insignificant alone adverse effect is still likely which has the potential to act in-combination with other plans and projects to be significant).

[35] Source: EC Case C-258-11 Reference for a Preliminary Ruling, Opinion of Advocate General Sharpston 'Sweetman' delivered on 22nd November 2012 (para 48)

[36] Source: EC Case C-127/02 Reference for a Preliminary Ruling 'Waddenzee' 7th Sept 2004 (para 48)

[37] Tyldesley, D. (2013) The Habitats Regulations Assessment Handbook. DTA Publications.

4.5.4 Plans and projects which are considered to be of most relevance to the in-combination assessment of the Local Plan include those that have similar impact pathways. These include those plans and projects that have the potential to increase development in the HRA study area. In addition, other plans and projects with the potential to increase traffic across the study area which may act in-combination with the Local Plan, such as transport, waste and mineral plans and projects, have also been taken into consideration. Plans which allocate water resources or are likely to influence water quality in the study area have been considered. Finally, neighbouring authority local plans which may increase development related pressures at Habitats sites have also been considered.

4.5.5 The assessment of potential in-combination effects has not resulted in additional impact pathways being screened in, however, a number of links between other plans and projects and the Local Plan have been identified and assessed in the HRA process.

4.5.6 The following neighbouring authorities' local plans, and other relevant plans and projects, and their HRA work have been reviewed as part of the screening assessment (see Appendix A).

- Reigate to Banstead Borough Council;
- Mid Sussex District Council;
- Horsham District Council;
- Tandridge District Council;
- Mole Valley District Council;
- Brighton and Hove City Council;
- Lewes District Council;
- Eastbourne Borough Council;
- Rother District Council;
- Sevenoaks District Council;
- South Downs National Park;
- Tunbridge Wells Borough Council;
- Wealden District Council;
- Epsom and Ewell District Council;
- Chichester District Council;
- South Downs National Park Authority;
- Arun District Council;
- Waverley Borough Council;
- West Sussex Joint Minerals Plan;
- West Sussex Waste Local Plan;
- West Sussex Transport Plan 2011 – 26;
- SES Water – Revised Draft Water Resources Management Plan 2019;
- Southern Water – Water Resource Management Plan 2020;
- South East Water – Water Resources Management Plan 2020 to 2080;
- Thames River Basin Management Plan; and
- Gatwick Airport Northern Runway.

4.5.7 Traffic and roads represent a cross boundary issue. On 20th March 2017 a high court ruling[38] found that traffic increases and subsequent air pollution on roads within 200m of a Habitats site also requires an in-combination approach that considers the development of neighbouring and nearby authorities. The approach adopted in the HRA for the assessment of in-combination effects is compliant with the Wealden Judgement.

4.6 Consideration of mitigation measures

4.6.1 The European Court Judgement on the interpretation of the Habitats Directive in the case of People Over Wind and Sweetman vs Coillte Teoranta (Case C-323/17[39]) determined that mitigation measures are only permitted to be considered as part of an appropriate assessment.

4.6.2 In light of this ruling, it is necessary to further define mitigation measures. The DTA Handbook notes that there are two types of measures as follows[40]:

- "*Measures intended to avoid or reduce harmful effects on a European site; or*
- *Features or characteristics of a plan which are essential in defining the nature, scale, location, timing, frequency or duration of the plan's proposals, or they may be inseparable aspects of the plan, without which an assessment of the plan could not properly be made, in the screening decision, even though these features or characteristics may incidentally have the effect of avoiding or reducing some or all of the potentially adverse effects of a plan*".

4.6.3 The HRA screening process undertaken for the Local Plan has not taken account of incorporated mitigation or avoidance measures that are intended to avoid or reduce harmful effects on a Habitats site when assessing the LSE of the Local Plan on Habitats sites. These are measures, which if removed (i.e. should they no longer be required for the benefit of a Habitats site), would still allow the lawful and practical implementation of a plan.

4.7 Stage 2: Appropriate Assessment and Integrity Test

4.7.1 Stage 2 of the HRA process comprises the Appropriate Assessment and integrity test. The purpose of the Appropriate Assessment (as defined by the DTA Handbook) is to "*undertake an objective, scientific assessment of the implications for the European site qualifying features potentially affected by the plan in light of their consideration objectives and other information for assessment*"[41].

[38] Wealden District Council & Lewes District Council before Mr Justice Jay. Available at: http://www.bailii.org/ew/cases/EWHC/Admin/2017/351.html [Date Accessed: 14/12/22]

[39] InfoCuria (2018) Case C-323/17. Available at: http://curia.europa.eu/juris/document/document.jsf?docid=200970&doclang=EN [Date Accessed: 14/12/22]

[40] Tyldesley, D. (2013) The Habitats Regulations Assessment Handbook. DTA Publications.

[41] Tyldesley, D. (2013) The Habitats Regulations Assessment Handbook. DTA Publications.

4.7.2 As part of this process decision makers should take account of the potential consequences of no action, the uncertainties inherent in scientific evaluation and should consult interested parties on the possible ways of managing the risk, for instance, through the adoption of mitigation measures. Mitigation measures should aim to avoid, minimise or reduce significant effects on Habitats sites. Mitigation measures may take the form of policies within the Local Plan or mitigation proposed through other plans or regulatory mechanisms. All mitigation measures must be deliverable and able to mitigate adverse effects for which they are targeted.

4.7.3 The Appropriate Assessment aims to present information in respect of all aspects of the Local Plan and ways in which it could, either alone or in-combination with other plans and projects, affect a Habitats site.

4.7.4 The plan-making body (as the Competent Authority) must then ascertain, based on the findings of the Appropriate Assessment, whether the Local Plan will adversely affect the integrity of a Habitats site either alone or in-combination with other plans and projects. This is referred to as the Integrity Test.

4.8 Dealing with uncertainty

4.8.1 Uncertainty is an inherent characteristic of HRA and decisions can be made only on currently available and relevant information. This concept is reinforced in the 7th September 2004 'Waddenzee' ruling[42]:

4.8.2 *"However, the necessary certainty cannot be construed as meaning absolute certainty since that is almost impossible to attain. Instead it is clear from the second sentence of Article 6(3) of the habitats directive that the competent authorities must take a decision having assessed all the relevant information which is set out in particular in the appropriate assessment. The conclusion of this assessment is, of necessity, subjective in nature. Therefore, the competent authorities can, from their point of view, be certain that there will be no adverse effects even though, from an objective point of view, there is no absolute certainty."*

4.9 The Precautionary Principle

4.9.1 The HRA process is characterised by the precautionary principle. This is described by the European Commission as being:

4.9.2 *"If a preliminary scientific evaluation shows that there are reasonable grounds for concern that a particular activity might lead to damaging effects on the environment, or on human, animal or plant health, which would be inconsistent with protection normally afforded to these within the European Community, the Precautionary Principle is triggered."*

[42] EC Case C-127/02 Reference for a Preliminary Ruling 'Waddenzee' 7th September 2004 Advocate General's Opinion (para 107)

5 Habitats sites

5.1 Identification of Habitats sites

5.1.1 Each Habitats site has its own intrinsic qualities, besides the habitats or species for which it has been designated, that enables the site to support the ecosystems that it does. An important aspect of this is that the ecological integrity of each site can be vulnerable to change from natural and human induced activities in the surrounding environment (known as pressures and threats). For example, sites can be affected by land use plans in a number of different ways, including the direct land take of new development, the type of use the land will be put to (for example, an extractive or noise-emitting use), the pollution / threat a development generates (air pollution or increased recreational pressure), and the resources used (during construction and operation for instance).

5.1.2 An intrinsic quality of any Habitats site is its functionality at the landscape ecology scale. This refers to how the site interacts with the zone of influence of its immediate surroundings, as well as the wider area. This is particularly the case where there is potential for developments resulting from the plan to generate water or air-borne pollutants, use water resources or otherwise affect water levels. Adverse effects may also occur via impacts to mobile species occurring outside a designated site, but which are qualifying features of the site. For example, there may be effects on protected bats that use land outside the designated site for foraging, feeding, roosting or other activities.

5.1.3 There is no guidance that defines the study area for inclusion in HRA. Planning Practice Guidance for Appropriate Assessment (listed above) indicates that:

5.1.4 "*The scope and content of an appropriate assessment will depend on the nature, location, duration and scale of the proposed plan or project and the interest features of the relevant site. 'Appropriate' is not a technical term. It indicates that an assessment needs to be proportionate and sufficient to support the task of the competent authority in determining whether the plan or project will adversely affect the integrity of the site*".

5.1.5 The 2019, 2020 and 2021 HRA reports on previous versions of the Local Plan (see Table 3.1) considered the scope of the HRA using a 'source-pathway-receptor' model. The Habitats sites to be assessed in this HRA report, taking into consideration impact pathways and previous HRA work undertaken, representations received on the HRA from Natural England (see Table 3.2) and further consultation with Natural England include the following:

- Ashdown Forest SAC;
- Ashdown Forest SPA;
- Mole Gap to Reigate Escarpment SAC;
- South West London Waterbodies SPA;
- South West London Waterbodies Ramsar;
- Arun Valley SPA;
- Arun Valley SAC;
- Arun Valley Ramsar; and
- The Mens SAC.

5.1.6 The HRA provides an assessment of potential effects associated with the Local Plan (both alone and in-combination) on the Habitats sites listed above, and as illustrated in Figure 5.1.

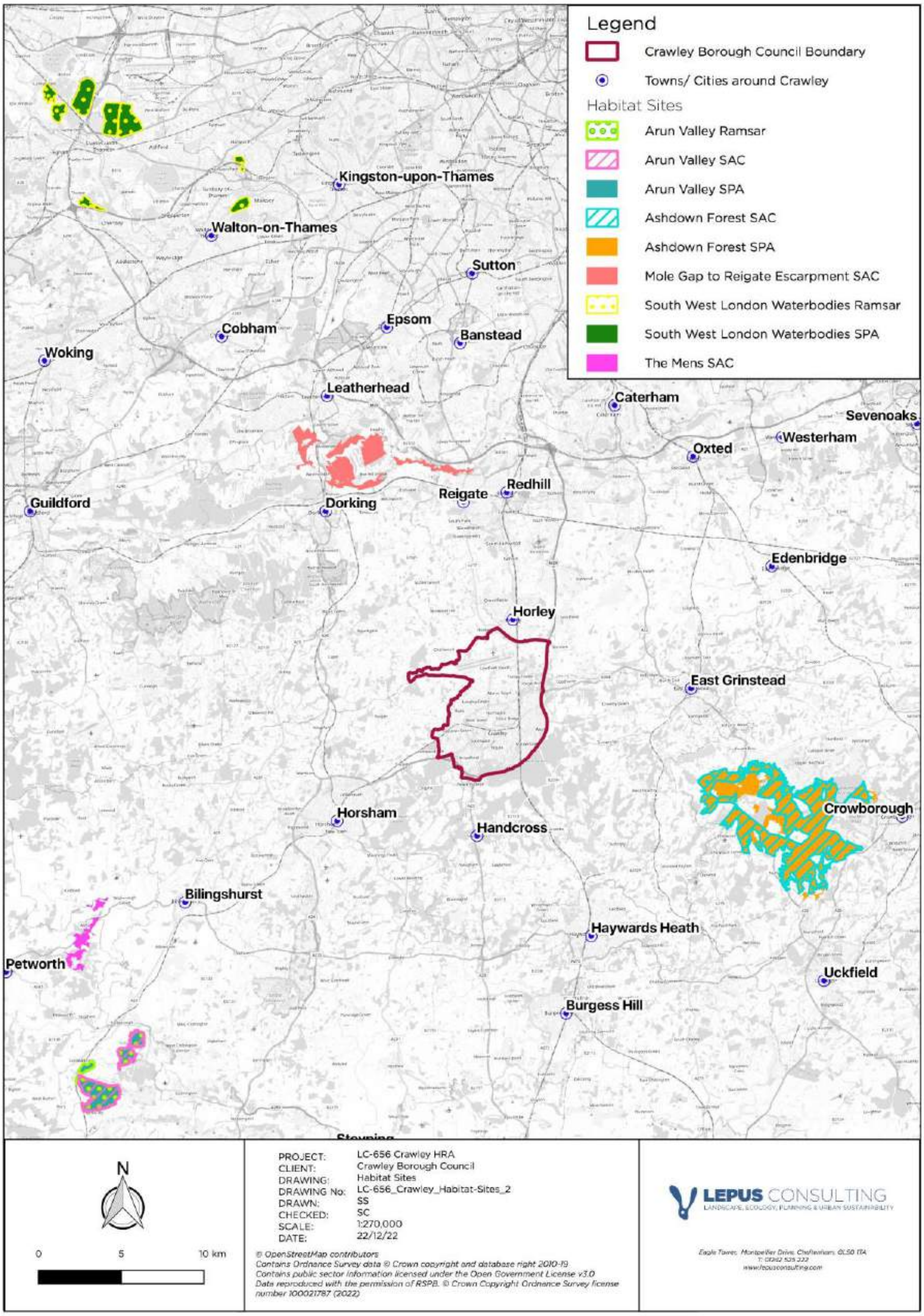

Figure 5.1: Habitats sites within HRA study area

5.2 Ashdown Forest SAC

5.2.1 Ashdown Forest SAC comprises an area of open lowland heath on the ridge of the High Weald Area of Outstanding Natural Beauty, located approximately 30 miles from London within Sussex. The underlying geology of the SAC, which is sandstone, and its exposed location have resulted in poor infertile soils which support both wet and dry heathland, valley mires and damp woodland.

5.2.2 The qualifying habitats of the SAC include both dry and wet heaths (Appendix B). The European dry heath is an extensive example of the south-eastern H2 *Calluna vulgaris – Ulex minor* community. This vegetation type is dominated by Heather *Calluna vulgaris,* Bell Heather *Erica cinerea* and Dwarf Gorse *Ulex minor,* with transitions to other habitats. It supports important lichen assemblages, including species such as *Pycnothelia papillaria.* The North Atlantic wet heath comprises one of the largest single continuous blocks of lowland heath in south-east England, with both European dry heaths and, in a larger proportion, wet heath present. The M16 *Erica tetralix – Sphagnum compactum* wet heath element provides suitable conditions for several species of bog-mosses Sphagnum spp., Bog Asphodel *Narthecium ossifragum*, Deergrass *Trichophorum cespitosum*, Common Cotton-Grass *Eriophorum angustifolium*, Marsh Gentian *Gentiana pneumonanthe* and Marsh Clubmoss *Lycopodiella inundata*[43]. The qualifying species of the SAC is the Great Crested Newt (*Triturus cristatus)* (Appendix B).

5.2.3 According to information presented in the combined SIP for Ashdown Forest SAC and SPA, the location is vulnerable to a number of threats which may be exacerbated by development set out in the Local Plan. These include air pollution, in particular atmospheric nitrogen deposition, public access and disturbance impacts, and hydrological change (see Appendix B); aspects recognised by Natural England who acknowledge that the SAC is vulnerable to acid deposition and changes in water quality and water quantity[44].

5.3 Ashdown Forest SPA

5.3.1 The qualifying features of the SPA (see Appendix B) are the breeding populations of Dartford Warbler (*Sylvia undata*) and Nightjar (*Caprimulgus europaeus*). The threats and pressures likely to be exacerbated by the Local Plan reflect those set out above for the SAC.

[43] Natural England 2019. Ashdown Forest SAC Conservation Objectives Supplementary Advice. http://publications.naturalengland.org.uk/file/6494201252675584 [Date Accessed 14/12/22].

[44] Ibid.

5.4 Mole Gap to Reigate Escarpment SAC

5.4.1 The Mole Gap to Reigate Escarpment SAC is located on a chalk ridge which forms the escarpment of the North Downs in Surrey. The River Mole cuts through the escarpment resulting in natural chalk cliffs. The SAC is extensively wooded (60%) and also includes areas of open downland (25%), particularly on the south-facing escarpment. The balance of the designated area is heath-scrub (15%). The habitat mosaic includes very species-rich chalk grassland, beech, ash and yew woodland, mixed chalk scrub including juniper, and on the plateau, an extensive area of 'chalk heath' where chalk-loving plants grow alongside those typically associated with acidic soils[45].

5.4.2 The qualifying features of the SAC (Appendix B) include a number of habitats (listed below) and two species which include Great Crested Newts and Bechstein's Bat (*Myotis bechsteinii).*

- *Stable xerothermophilous* formations with Buxus sempervirens on rock slopes (*Berberidion p.p.*) *Sclerophyllous scrub* (matorral);
- Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (this includes the priority feature "important orchid rich sites");
- *Taxus baccata* woods of the British Isles;
- European dry heaths; and
- *Asperulo-Fagetum* beech forests.

5.4.3 According to data set out in Natural England's SIP for the site, the SAC is vulnerable to public access and disturbance impacts, in particular: trampling of orchid-rich grasslands, repetitive disturbance to Great Crested Newt breeding ponds, and spread of disease. Information presented in Natural England's Supplementary Advice identifies the potential sensitivity of the SAC to air quality impacts in terms of the deposition of airborne pollutants, as well as to hydrological changes. Roosting habitats for Bechstein's Bats (disused lime kilns and caverns at the site) and commuting routes from roosts into surrounding habitat and foraging areas are also vulnerable to disturbance[46].

5.4.4 South West London Waterbodies SPA and Ramsar

[45] Natural England 2019. Mole Gap to Reigate Escarpment SAC Conservation Objectives Supplementary Advice. http://publications.naturalengland.org.uk/file/6354450398838784 [Date Accessed 14/12/22].

[46] Natural England. 2014. Site Improvement Plan. Mole Gap to Reigate Escarpment SAC. http://publications.naturalengland.org.uk/file/6256378880458752 [Date Accessed: 14/12/22].

5.4.5 The South West London Waterbodies SPA comprises a series of embanked water supply reservoirs and former gravel pits which support a range of man-made and semi-natural still, open-water habitats. The complex is situated to the west of London on the broad floodplain of the River Thames. The lakes and reservoirs have varying levels of public use. Some are closed to the public, but most have long-established recreational use. The uses include sailing, canoeing, water-skiing, fishing, birdwatching, diver training and open water swimming[47].

5.4.6 The SPA is designated for the internationally important non-breeding numbers of Gadwall (*Anas strepera)* and Shoveler *(Anas clypeata).* Information presented in the SIP indicates that the SPA is vulnerable to public access and disturbance impacts, with data contained in the Supplementary Advice[48] indicating that it is also vulnerable to air quality and hydrology impacts (see Appendix B).

5.5 South West London Waterbodies Ramsar

5.5.1 As with the SPA, the South West London Waterbodies Ramsar site is designated for the internationally important non-breeding numbers of Gadwall and Shoveler and, whilst no threats are identified in the Ramsar information sheet, it is likely to be vulnerable to similar threats and pressures set out above for the SPA.

5.6 Arun Valley SAC

5.6.1 The Arun Valley SAC is located in the South Downs in West Sussex approximately 24.6km to the south-west of the Plan area. It consists of low-lying grazing marsh, predominantly on alluvial soils, but with an area of peat derived from a relict raised bog. Local differences in soil conditions and water supply have resulted in a range of ecological conditions and a diverse flora and fauna across the site. The southern components of the Arun Valley are fed by calcareous springs, with the northern components, where the underlying geology is Greensand, being fed by more acidic water[49].

5.6.2 The qualifying feature of the SAC is the Little Whirlpool Ram's-Horn Snail (*Anisus vorticulus*). The snail relies on unpolluted calcareous water in marsh drains with a dense aquatic flora. It is particularly associated with ditches with a diverse flora but little emergent vegetation. The Arun Valley SAC designated area provides one of the three main population centres for this species of snail in the UK.

[47] Natural England. 2018. European Site Conservation Objectives: Supplementary advice on conserving and restoring site features. South West London Waterbodies SPA. Available at: http://publications.naturalengland.org.uk/file/5893345162821632 [Date Accessed: 14/12/22].

[48] Natural England. 2018. European Site Conservation Objectives: Supplementary advice on conserving and restoring site features. South West London Waterbodies SPA. Available at: http://publications.naturalengland.org.uk/file/5893345162821632 [Date Accessed: 14/12/22].

[49] Natural England. 2019. European Site Conservation Objectives: Supplementary advice on conserving and restoring site features. Arun Valley SAC Available at: http://publications.naturalengland.org.uk/file/6257846618685440 [Date Accessed: 14/12/22].

5.6.3 According to information in the SIP and Supplementary Advice for the Arun Valley SAC, the Little Whirlpool Ram's-Horn Snail is highly sensitive to changes in water levels and water pollution (in particular increased levels of phosphates) [50,51] (Appendix B).

5.6.4 In a letter to all affected LPAs in September 2021, and an Advice Note in February 2022, Natural England advised that the Arun Valley designations (SAC, SPA and Ramsar) are vulnerable to changes in water levels from existing levels of abstraction from the Sussex North Water Zone Supply. An increase in abstraction to meet water demand for growth set out in the Local Plan has the potential to exacerbate these impacts[52].

5.7 Arun Valley SPA

5.7.1 The Arun Valley SPA is designated for the non-breeding population of Bewick Swan *Cygnus columbianus bewickii*) and assemblage of waterfowl (including: Shoveler *Anas clypeata*, Teal *Anas crecca* and Wigeon *Anas penelope* that the site supports. Broad habitat types within the SPA designation which support these species of birds include the following:

- *Cynosurus cristatus-Centaurea nigra* lowland meadows;
- Inland wet grassland;
- *Glyceria maxima* (Reed Sweet-grass) swamp;
- *Glyceria fluitans* (floating-sweet grass) water-margin vegetation; and
- Network of ditch systems.

5.7.2 As set out above for the SAC, data presented in the SIP and Supplementary Advice indicates the qualifying features of this site are highly sensitive to changes in water levels and water pollution (in particular increased levels of phosphates). This is reinforced by Natural England in their advice to LPAs. This information also highlights the vulnerability of qualifying species of birds to human disturbance (Appendix B).

5.8 Arun Valley Ramsar

5.8.1 The Arun Valley Ramsar is designated for a number of British Red Data Book species of invertebrates and plant species that it supports. In addition, it is also designated due to its winter waterfowl population and winter populations of Northern pintail (*Anas acuta*) (Appendix B).

5.8.2 Data set out in the Arun Valley Ramsar Information Sheet[53] identifies water extraction for public supply as a potential threat to the site's ecological character (Appendix B). This is reinforced by Natural England in their advice to LPAs.

[50] Natural England. 2019. European Site Conservation Objectives: Supplementary advice on conserving and restoring site features. Arun Valley SAC Available at: http://publications.naturalengland.org.uk/file/6257846618685440 [Date Accessed: 14/12/22].

[51] Natural England. 2014. Site Improvement Plan. Arun Valley SPA and SCI. Available at: http://publications.naturalengland.org.uk/file/5185212862431232. [Date Accessed: 14/12/22].

[52] https://crawley.gov.uk/planning/planning-applications/you-apply/water-neutrality-crawley

[53] JNCC. 2008. Information Sheet on Ramsar Wetlands. Arun Ramsar. https://jncc.gov.uk/jncc-assets/RIS/UK11005.pdf Date Accessed: 14/12/22].

5.9 The Mens SAC

5.9.1 The Mens SAC is an area of ancient woodland in West Sussex and supports a significant population of Barbastelle Bat (*Barbastelle barbastellus*)[54]. The woodland comprises Sessile Oak (*Quercus petraea)* and Pedunculate Oak (*Quercus robur)*, Beech (*Fagus sylvatica)*, Holly (*Ilex aquifolium)* and locally, Ash (*Fraxinus excelsior)*, Birches (*Betula* spp.) and Wild Service tree (*Sorbus torminalis)*. Beech dominates the lighter soils over an understorey of Holly and Yew (*Taxus baccata)*. The SAC also supports important invertebrate, fungi, lichen and bryophyte assemblages. The qualifying features of the SAC include beech forests on acid soil and the Barbastelle Bat (Appendix B).

5.9.2 Data contained in Natural England's SIP for the SAC indicates that it is vulnerable to public access and disturbance impacts (in particular light pollution), change in land management, habitat connectivity and air pollution. In addition, information set out in Natural England's Supplementary Advice identifies the potential sensitivity of the SAC to changes in water quality and quantity in foraging grounds where bats feed on aquatic invertebrates. It reads that *"for many SAC features which are dependent on wetland habitats supported by surface and/or ground water, maintaining the quality and quantity of water supply will be critical, especially at certain times of year. Poor water quality and inadequate quantities of water can adversely affect the structure and function of this habitat type"* (Appendix B).

5.9.3 A body of research has been undertaken since 1998 to identify Barbastelle Bat foraging habitat within the wider landscape[55]. This work involved radio-tracking and showed Barbastelle Bats forage up to 7km from their roost sites, within areas that lie to the east of The Mens SAC, principally on the floodplain of the River Arun[56]. The outputs of this work show that major threats to Barbastelle Bats include those affecting their roosts, foraging areas and connective landscape features between them, acknowledging that often these threats are indirect.

5.10 Ecological information

5.10.1 The CJEU ruling in the Holohan case (C-461/17[57]) confirmed that appropriate assessment should: (i) catalogue (i.e. list) all habitats and species for which the site is protected and (ii) include in its assessment other (i.e. non-protected) habitat types or species which are on the site and habitats and species located outside of the site if they are necessary to the conservation of the habitat types and species listed for the protected area.

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[54] Natural England 2019. The Mens SAC Conservation Objectives Supplementary Advice. http://publications.naturalengland.org.uk/file/5113429933424640 [Date Accessed 14/12/22].

[55] Greenaway, F. 200. Advice for the management of flightlines and foraging habitats of the barbastelle bat Barbastellus barbastellus. English Nature Research Report, Number 657.

[56] Greenaway, F. 2008. Barbastelle bats in the Sussex West Weald 1997 – 2008.

[57] EUR-Lex (2018) Case C-461/17. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:62017CJ0461&from=EN [Date Accessed: 14/12/22]

5.10.2 This HRA report fully considers the potential for effects on species and habitats which are not listed as a qualifying feature for the Habitats site, but which may be important to achieving its conservation objectives. This ensures that the functional relationships underlying Habitats sites and the achievement of their conservation objectives are adequately understood.

5.10.3 Sites of Special Scientific Interest (SSSIs) are protected areas in the United Kingdom designated for conservation. SSSIs are the building blocks of site-based nature conservation in the UK. A SSSI will be designated based on the characteristics of its fauna, flora, geology and/or geomorphology. Whilst typically analogous in ecological function, the reasons for its designation can be entirely different to those for which the same area is designated as a SAC, SPA or Ramsar.

5.10.4 Natural England periodically assesses the conservation conditions of each SSSI unit, assigning it a status. SSSIs located either entirely or partially within the Habitats sites considered in this report are listed in Appendix C along with their current conservation status. The conservation status of each SSSI highlights any SAC/SPA that is currently particularly vulnerable to threats/pressures. Conservation status is defined as follows:

- Favourable;
- Unfavourable – recovering;
- Unfavourable – no change; or
- Unfavourable – declining.

5.10.5 SSSI units in either an 'Unfavourable – no change' or 'Unfavourable – declining' condition indicate that the Habitats site may be particularly vulnerable to certain threats or pressures. It is important to remember that the SSSI may be in an unfavourable state due to the condition of features unrelated to its Habitats designation. However, it is considered that the conservation status of SSSI units that overlap with Habitats designated sites offer a useful indicator of habitat health at that location.

5.10.6 Natural England defines zones around each SSSI which may be at risk from specific types of development, these are known as Impact Risk Zones (IRZ). These IRZs are *"a GIS tool developed by Natural England to make a rapid initial assessment of the potential risks to SSSIs posed by development proposals. They define zones around each SSSI which reflect the particular sensitivities of the features for which it is notified and indicate the types of development proposal which could potentially have adverse impacts. The IRZs also cover the interest features and sensitivities of European sites, which are underpinned by the SSSI designation and "Compensation Sites", which have been secured as compensation for impacts on Natura 2000/Ramsar sites"*[58]. The location of IRZs has been taken into consideration in this assessment as they provide a useful guide as to the location of functionally linked land and likely vulnerabilities to development proposed within the Local Plan.

[58] Natural England (2019) Natural England's Impact Risk Zones for Sites of Special Scientific Interest User Guidance. Available at: https://magic.defra.gov.uk/Metadata_for_magic/SSSI%20IRZ%20User%20Guidance%20MAGIC.pdf [Date Accessed: 14/12/22]

6 Scoping of Impact Pathways

6.1 Gathering information about impact pathways

6.1.1 It is important to understand how the Local Plan may affect a Habitats site in order to determine LSEs. Consideration must first be given to potential links or causal connections between the effects of the Local Plan and Habitats sites. This section therefore scopes potential impact pathways at the Habitats sites shown on Figure 5.1.

6.2 Threats and pressures

6.2.1 Threats and pressures to which each Habitats site is vulnerable have been identified through reference to data held by the JNCC on Natura 2000 Data Forms and Site Improvement Plans (SIPs). This information provides current and predicted issues at each Habitats site. Threats and pressures which are likely to be impacted by the Local Plan at each Habitats site are set out in Section 5 and Appendix B. It is noted that each Habitats site may be vulnerable to other threats and pressures which are outside the scope of the Local Plan. These threats and pressures have not been included in this assessment, having been scoped out.

6.2.2 Supplementary advice notices prepared by Natural England provide more recent information on threats and pressures upon Habitats sites than SIPs. Additional threats flagged up by supplementary advice notices which may be impacted by the Local Plan have also been identified (Section 5).

6.2.3 Following a review of HRA assessment work undertaken to date for the Local Plan, consultation received from Natural England and an identification of causal connections and links, the threats and pressures that are considered to be within the scope of influence of the Local Plan include:

- Changes to air quality;
- Hydrological changes (to include water abstraction, water levels and water pollution);
- Impacts on functionally linked habitat (to include offsite habitat availability/management and loss of habitat connectivity) and
- Public access and disturbance (to include recreational disturbance and urbanisation threats).

6.3 Air quality

6.3.1 Air pollution can affect a Habitats site if it has an adverse effect on its features of qualifying interest. The main mechanisms through which air pollution can have an adverse effect is through eutrophication (nitrogen), acidification (nitrogen and sulphur) and direct toxicity (ozone, ammonia and nitrogen oxides)[59]. Deposition of air pollutants can alter the soil and plant composition and species which depend upon these.

6.3.2 Excess atmospheric nitrogen deposition within an ecosystem or habitat can disrupt the delicate balance of ecological processes interacting with one another. As the availability of nitrogen increases in the local environment, some plants that are characteristic of that ecosystem may become competitively excluded in favour of more nitrophilic plants. It also upsets the ammonium and nitrate balance of the ecosystem, which disrupts the growth, structure and resilience of some plant species.

6.3.3 Excess nitrogen deposition often leads to the acidification of soils and a reduction in the soils' buffering capacity (the ability of soil to resist pH changes). It can also render the ecosystem more susceptible to adverse effects of secondary stresses, such as frost or drought, and disturbance events, such as foraging by herbivores.

6.3.4 As an attempt to manage the negative consequences of atmospheric nitrogen deposition and acidification, 'critical loads' and 'critical levels' have been established for ecosystems across Europe. Each Habitats site is host to a variety of habitats and species, the features of which are often designated a critical load for nitrogen deposition. The critical loads of pollutants are defined as a:

6.3.5 "…*quantitative estimate of exposure to one or more pollutants below which significant harmful effects on specified sensitive elements of the environment do not occur according to present knowledge*"[60].

6.3.6 Critical levels are defined as "*concentrations of pollutants in the atmosphere above which direct adverse effects on receptors, such as human beings, plants, ecosystems or materials, may occur according to present knowledge*"[61].

[59] APIS (2016) Ecosystem Services and air pollution impacts. Available at: http://www.apis.ac.uk/ecosystem-services-and-air-pollution-impacts. [Date Accessed: 09/11/22]

[60] Coordination Centre for Effects (CCE). Critical load and level definitions. Available at: https://www.umweltbundesamt.de/en/Coordination_Centre_for_Effects [Date Accessed: 15/12/22]

[61] Coordination Centre for Effects (CCE). Critical load and level definitions. Available at: https://www.umweltbundesamt.de/en/Coordination_Centre_for_Effects [Date Accessed: 15/12/22]

6.3.7 Natural England has developed a standard methodology for the assessment of traffic related air quality impacts under the Habitats Regulations which is relevant to the HRA of land use plans[62]. In addition, the Institute of Air Quality Management (IAQM)[63] and the Chartered Institute of Ecology and Environmental Management (CIEEM)[64] have also prepared advice on the assessment of air quality impacts at designated sites. This guidance sets a number of thresholds for screening of Likely Significant (air quality) Effects (LSEs) at the HRA screening stage (Stage 1 of the HRA process) and methodologies for further Appropriate Assessment and ecological interpretation of air quality impacts.

6.3.8 The Natural England methodology sets out a staged approach to the scoping and ultimate screening of likely significant air quality effects which has been applied in this scoping exercise[65]. The first step is to determine which Habitats sites are likely to be affected by growth set out in the Local Plan. This is undertaken by identifying if the Local Plan will give rise to emissions which are likely to reach a Habitats site.

6.3.9 The Local Plan will result in housing and employment growth which will trigger an increase in traffic related emissions to air within and beyond the Plan area. Data obtained from the Office for National Statistics highlights the most common destinations for journeys to work undertaken by car or van arising from Crawley and those finishing in Crawley[66]. It is noted that these figures do not include journeys to work that both start and end in Crawley. This data shows that the key commuting areas include the neighbouring authorities of Mid-Sussex, Brighton and Hove, Horsham, Mole Valley and Reigate and Banstead, Tandridge and Wealden. It is however noted that there is likely to be considerable variance between these destinations, as travel patterns will invariably focus on routes/journeys to significant attractors, such as towns centres and other major employment, retail and leisure areas. It is therefore likely that more remote sites in districts, with lower journey numbers to/from Crawley, are less likely to be affected.

6.3.10 Habitats sites which are within this 'key commuting area', and which were shown to be sensitive to air quality (Section 5) are listed below. It is considered that traffic related emissions to air from the Local Plan will not reach Habitats sites which are located outside the 'key commuting area'.

- Mole Gap to Reigate Escarpment SAC;

[62] Natural England (2018) Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations (NEA001). Available at: http://publications.naturalengland.org.uk/publication/4720542048845824 [Date Accessed: 14/12/22]

[63] 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.

[64] CIEEM (2021) Advice on Ecological Assessment of Air Quality Impacts. Chartered Institute of Ecology and Environmental Management. Winchester, UK.

[65] Natural England (2018) Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations (NEA001). Available at: http://publications.naturalengland.org.uk/publication/4720542048845824 [Date Accessed: 14/12/22]

[66] Office for National Statistics (2011) Location of usual residence and place of work by method of travel to work (2011 census data). Available at: https://www.nomisweb.co.uk/census/2011/wu03uk/chart and https://www.nomisweb.co.uk/census/2011/wu03uk [Date Accessed: 14/12/22]

- Ashdown Forest SAC; and
- Ashdown Forest SPA.

6.3.11 As set out in Section 5, these Habitats sites are sensitive to the effects of air quality. The following data obtained from APIS highlights existing sensitivities of these designations to background air quality effects.

6.3.12 The qualifying habitats within Ashdown Forest SAC (European dry heaths and northern wet heaths) are known to be sensitive to changes in air quality. Data presented on APIS indicates that nitrogen deposition is currently within the 10-20 kg/ha/yr critical load for these habitat types at an average of 19.5kg/ha/yr[67]. Maximum levels however exceed the critical loads at 20.8kg/ha/yr. No Critical Load has been assigned to the EUNIS classes for meso/eutrophic systems upon which Great Crested Newts rely. These systems are often phosphorus limited (or N/P co-limiting) and often associated with agricultural land use sources.

6.3.13 The structure and function of heathland habitat and coniferous woodland which supports the qualifying features of Ashdown Forest SPA (Nightjar and Dartford Warbler) are sensitive to changes in air quality. Exceeding critical values for air pollutants may result in changes to the chemical status of these habitat substrates, accelerating or damaging plant growth, altering vegetation structure and composition. As summarised above for Ashdown Forest SAC, current maximum levels of background nitrogen deposition exceed critical loads for heathland type. The coniferous woodland habitat within Ashdown Forest SPA is also sensitive to changes in air quality. The critical load range for coniferous woodland is 5-15 kg/ha/yr. Data contained on APIS indicates that the range of nitrogen deposition provided for coniferous woodland is based on research into northern pine and spruce forests. The lower end of this range (5kg N/ha/yr) is determined by the potential of a site to support a diverse lichen and bryophyte community[68]. This habitat type is not present at this woodland and therefore the upper end of this critical load range is considered to be the most appropriate level to apply in this assessment. APIS data indicates that nitrogen deposition is currently over the upper end of this critical load range (15 kg/ha/yr) for this habitat type at an average of 33.8/ha/yr[69].

6.3.14 The European dry heaths, natural box scrub, dry grasslands and scrublands on chalk or limestone, beech forests on neutral to rich soils and yew-dominated woodland qualifying features of Mole Gap to Reigate Escarpment SAC are vulnerable to atmospheric nitrogen deposition. Species such as Bechstein's Bat and Great Crested Newt are also sensitive to atmospheric nitrogen deposition as they are reliant upon these habitats.

6.3.15 Table 6.1 summarises the critical levels and current deposition at Mole Gap to Reigate Escarpment SAC. All data has been taken from the Air Pollution Information System (APIS)[70].

[67] Air Pollution Information System (APIS). Available at: https://www.apis.ac.uk/ [Date Accessed: 15/12/22]

[68] APIS. Nitrogen Deposition – Coniferous Woodland. Available at: http://www.apis.ac.uk/node/969 [Date Sourced: 21/12/22]

[69] Air Pollution Information System (APIS). Available at: https://www.apis.ac.uk/ [Date Accessed: 15/12/22]

[70] Air Pollution Information Systems. Site relevant critical loads, available at: https://www.apis.ac.uk/ [Date Accessed: 15/12/22]

Table 6.1: Nitrogen deposition Critical Loads of Mole Gap to Reigate Escarpment SAC

Qualifying features	Relevant Nitrogen Critical Load Class	Empirical Critical Load (kg N/ha/yr)	Current Nitrogen Deposition (kg N/ha/yr)
Taxus baccata woods of the British Isles (H91J0)	Coniferous woodland	5-15	Max: 31.7 Min: 29.1 Average: 30.5
European dry heaths (H4030)	Dry heaths	10-20	Max: 18.2 Min: 16.7 Average: 17.6
Asperulo-Fagetum beech forests (H9130)	Fagus woodland	10-20	Max: 31.7 Min: 29.1 Average: 30.5
Stable xerothermophilous formations with *Baxus sempervirens* on rock slopes (*Berberidion* pp) (H5110)	Sub-atlantic semi-dry calcareous grassland	15-25	Max: 31.7 Min: 29.1 Average: 30.5
Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (H6210)	Sub-atlantic semi-dry calcareous grassland	15-25	Max: 18.2 Min: 16.7 Average: 17.6
Myotis bechsteinii Bechstein's Bat (S1323)	Broadleaved deciduous woodland	10-20	Max: 31.7 Min: 29.1 Average: 30.5
Triturus cristatus Great Crested Newt (S1166)	No comparable habitat with established critical load estimate available.	n/a	Max: 15.6 Min: 11.6 Average: 13.9

6.3.16 As can be seen in Table 6.1, the current levels of nitrogen deposition at Mole Gap to Reigate Escarpment SAC are within the critical load for European dry heaths and dry grasslands and scrublands on chalk or limestone that receive an average of 17.6kg N/ha/yr. However, they exceed the critical load for all other habitat types as the current average is 30.5kg N/ha/yr[71].

[71] Air Pollution Information System APIS. Site relevant critical loads, available at: https://www.apis.ac.uk/ [Date Accessed: 15/12/22]

6.3.17 It is widely accepted that air quality impacts are greatest within 200m of a road source, decreasing with distance[72, 73, 74]. The next step in Natural England's screening methodology is to identify whether qualifying features, which are sensitive to changes in air quality, are located within 200m of a road and whether these could therefore be exposed to emissions.

6.3.18 There are several strategic roads (A and B grade roads) located within 200m of Ashdown Forest SAC and SPA. A number of non-strategic roads also pass throughout and close to the SAC and SPA.

6.3.19 Three sections of the Mole Gap to Reigate Escarpment SAC lie within 200m of a motorway or 'A' road. The M25 is located within 200m of an area to the south east of Mole Gap to Reigate Escarpment SAC. The A24 runs north to south within 200m of two designated areas of the Mole Gap to Reigate Escarpment SAC. The A25 runs parallel with the south of Mole Gap to Reigate Escarpment SAC and in some areas is within 200m of the Habitats site. The A217 to the north of Reigate runs immediately adjacent to the eastern section of the SAC. In addition, several B grade and smaller roads that form the minor road network lie within 200m of the SAC.

6.3.20 Given the sensitivities of the Mole Gap to Reigate Escarpment SAC, Ashdown Forest SAC and Ashdown Forest SPA to changes in air quality, the next step in Natural England's methodology is to understand if the qualifying features of each site could be exposed to a change in air quality.

6.3.21 Obtaining an early understanding of the spatial distribution of qualifying features within a site helps to inform this stage of the assessment. A preliminary review of aerial photography indicates that features for which the SACs and SPA are designated are likely to lie within 200m of a strategic road link.

6.3.22 The Natural England advice states that consideration should next be given to the risk of road traffic emissions associated with the Local Plan when screening air quality likely significant effects. The advice provided by Natural England notes that an assessment of the risks from road traffic emissions can be expressed in terms of the average annual daily traffic flow (AADT) as a proxy for emissions. The use of the AADT screening threshold is advocated by Highways England in their Design Manual for Roads and Bridges (DMRB). This screening threshold is intended to be used as a guide to determine whether a more detailed assessment of the impact of emissions from road traffic is required. This non-statutory, or guideline threshold, is based on a predicted change of daily traffic flows of 1,000 AADT or more (or a change in heavy-duty vehicle (HDV) flows on motorways of 200 AADT or more).

[72] The Highways Agency, Transport Scotland, Welsh Assembly Government, The Department for Regional Development Northern Ireland (2007) Design Manual for Roads and Bridges, Volume 11, Section 3, Part 1: Air Quality.

[73] Natural England (2016) The ecological effects of air pollution from road transport: an updated review. Natural England Commissioned Report NECR 199.

[74] Bignal, K., Ashmore, M. & Power, S. (2004) The ecological effects of diffuse air pollution from road transport. English Nature Research Report No. 580, Peterborough.

6.3.23 Traffic data was provided by Stantec in 2021. This traffic data was derived from the Crawley Transport Model. This is a SATURN[75] based highway assignment model. Traffic data was provided as AADT movements and HDV movements for the following three scenarios (Figure 6.1):

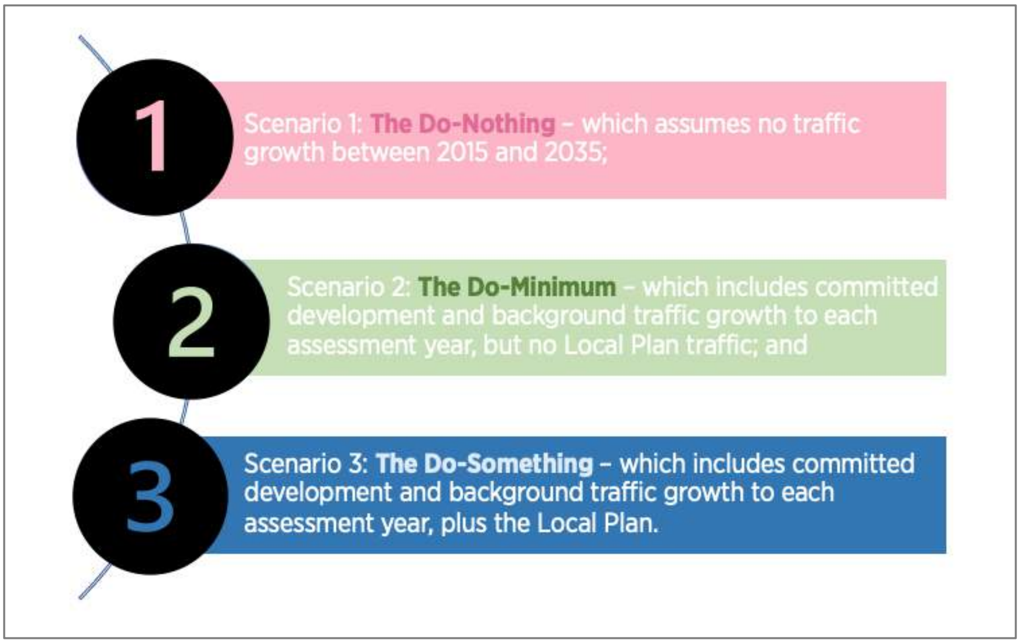

Figure 6.1: Traffic modelling scenarios

6.3.24 It is noted that the transport work undertaken by Stantec modelled to the end of the plan period at the time of commission. The plan period has since been extended to 2040. The transport study has reviewed the implications of this and concludes that the additional two-to-three-year background growth attributable to neighbouring authorities, would be within the uncertainties inherent in forecasting over long periods usually covered by Local Plans (i.e., 15 to 20 years). Further details can be found in the transport study[76].

6.3.25 The results for the Do-Minimum and Do-Something scenarios were compared against one-another to show the impacts of the Local Plan in-isolation (alone). The in-combination assessment was completed by comparing the results of the Do-Nothing and the Do-Something scenarios.

6.3.26 A summary of traffic data provided by Stantec for road links within the model which are located within 200m of Ashdown Forest SAC, Ashdown Forest SPA and Mole Gap to Reigate Escarpment SAC is presented in Table 6.2. This data was screened against Natural England's 1,000 AADT threshold for LSEs.

[75] Simulation and Assignment of Traffic to Urban Road Networks (SATURN) is a computer program that calculates transport assignment on road networks.

[76] Stantex. 2022. Crawley Transport Study. Available at: https://crawley.gov.uk/sites/default/files/2022-07/Crawley%20Transport%20Study%20Report%20June%202022.pdf [Date Accessed: 12/01/23]

Table 6.2: Summary of traffic data – Change in AADT considered first alone and in-combination (changes over 1,000 AADT have been highlighted in red shading for alone impacts, where there are no alone impacts shading has been used to represent in-combination impacts)

Road Link Description	Difference between Do Something and Do Nothing (relative contribution of Crawley Local Plan to growth alone)	Difference between 2019 Base and Do Something ('in combination' growth)
Mole Gap to Reigate Escarpment SAC	ALONE	IN-COMBINATION
A25 Reigate Road between A25 Reigate/Brockham Ln junction and A25 Reigate/A24	99	5,722
A217 Reigate Hill between A217 Reigate Hill/Raglan Rd junction and A217 Reigate Hill/Wray Ln junction	926	8.882
A24 south of the A246/B2450/A24 Roundabout to the A24/A25 junction	31	6,861
B2032 between the A25 (to the south) and the Tadworth Rbt (to the north)	17	2,938
M25 between J8 and J9	1763	25,650
Ashdown Forest SAC and SPA	ALONE	IN-COMBINATION
A26 through Crowborough/Poundgate/High Huntwood[77]	143	16,868
A27 between A22 Wych Cross/A275 Lewes Road Road junction and A22/A272 Batts Bridge Road junction[78]	216	2,226
A22 between East Grinstead and A22 Wych Cross/A27 Lewes Road junction[79]	-234	-5,539
A275 between A22/A275 junction and A272/A275 junction[80]	325	11,065

6.3.27 Traffic modelling for Mole Gap to Reigate Escarpment SAC showed that there is one exceedance of the 1,000 AADT screening threshold along the M25 between Junction 8 and 9 from the Local Plan alone. Given there is no alone exceedance of thresholds on other road inks provided in the traffic modelling, it is necessary to next consider effects in-combination. When considered in-combination the data for these road links shows that all links exceed Natural England's 1,000 AADT threshold in-combination with other plans and projects.

6.3.28 Traffic modelling for Ashdown Forest SAC and SPA showed no exceedances of Natural England's 1,000 AADT threshold for road links within 200m of the Ashdown Forest SAC and SPA when considered alone. Traffic flows are shown to decrease on the A22. Given there is no alone exceedance of thresholds it is necessary to next consider effects in-combination. When considered in-combination the data shows that there is an exceedance of Natural England's 1,000 AADT threshold in-combination on all road links, with the exception of the A22.

[77] Cross reference to Ashdown Forest SoCG: A26 (Poundgate)

[78] Cross reference to Ashdown Forest SoCG: A22 (Wych Cross) and A22 (Nutley)

[79] Cross reference to Ashdown Forest SoCG: A22 (Royal Ashdown Forest Golf Course)

[80] Cross reference to Ashdown Forest SoCG: A275 (Wych Cross)

6.3.29 As noted in Natural England[81] and CIEEM's[82] guidance on the assessment of air quality at designated sites, AADT thresholds do not themselves imply any intrinsic environmental effects, instead being used solely as a trigger for further investigation in the HRA process.

6.3.30 Given the exceedances identified in Table 6.2, air quality modelling was therefore commissioned to better define air quality impacts. This modelling is reported upon in Air Quality Consultants (AQC) Crawley Borough Council Air Quality Assessment Report[83] (referred to hereafter as the Air Quality Report (AQR)) – Appendix D.

6.3.31 Transects included in the air quality modelling for each Habitats site are illustrated in Figures 6.2 and 6.3.

[81] Natural England (2018) Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations (NEA001). Available at: http://publications.naturalengland.org.uk/publication/4720542048845824 [Date Accessed: 02/02/21]

[82] CIEEM. January 2021. Advisory Note: Ecological Assessment of Air Quality Impacts

[83] Air Quality Consultants. April 2021. Crawley Borough Council Local Plan Air Quality Assessment.

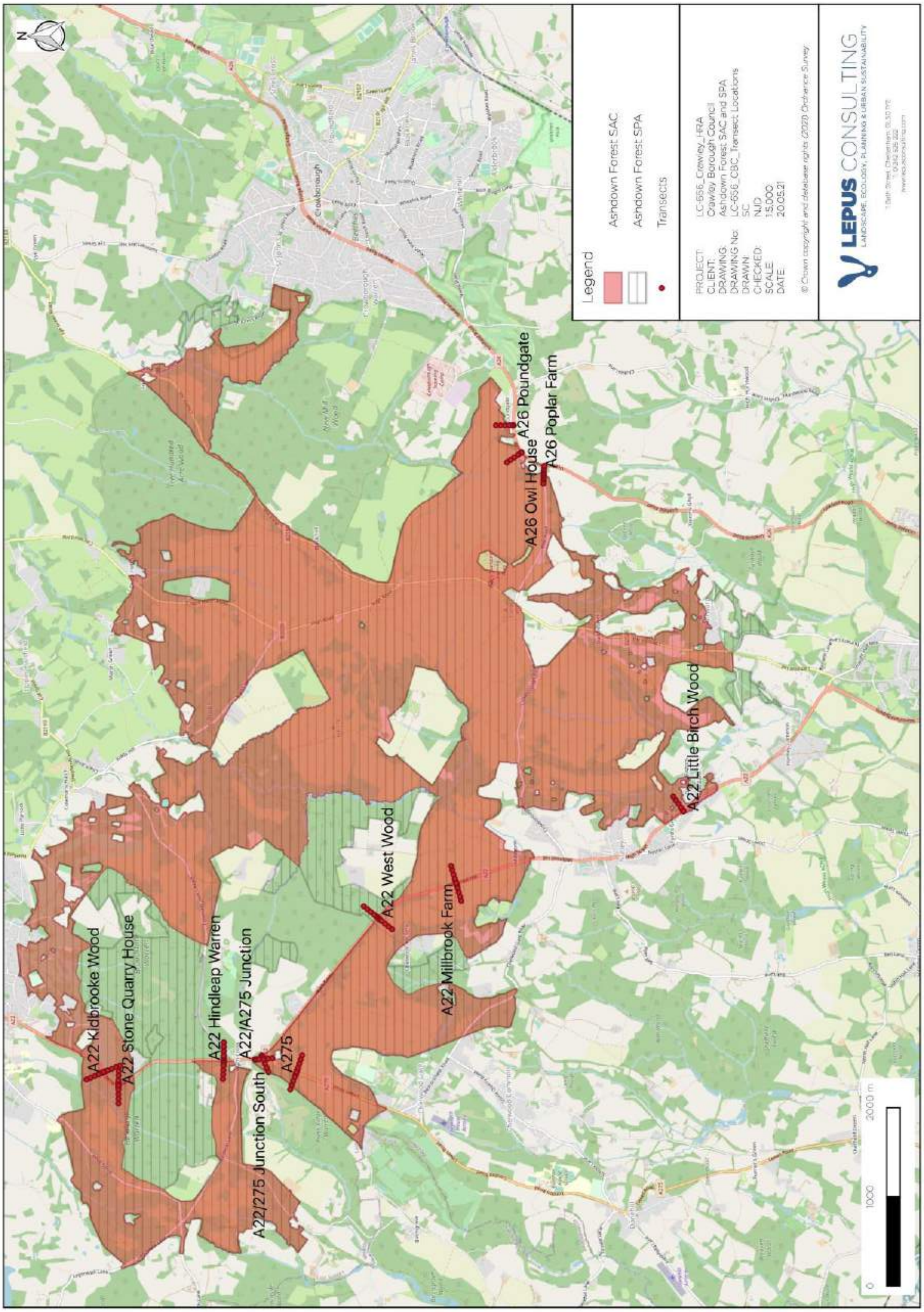

Figure 6.2: Air quality modelling transects at Ashdown Forest SAC

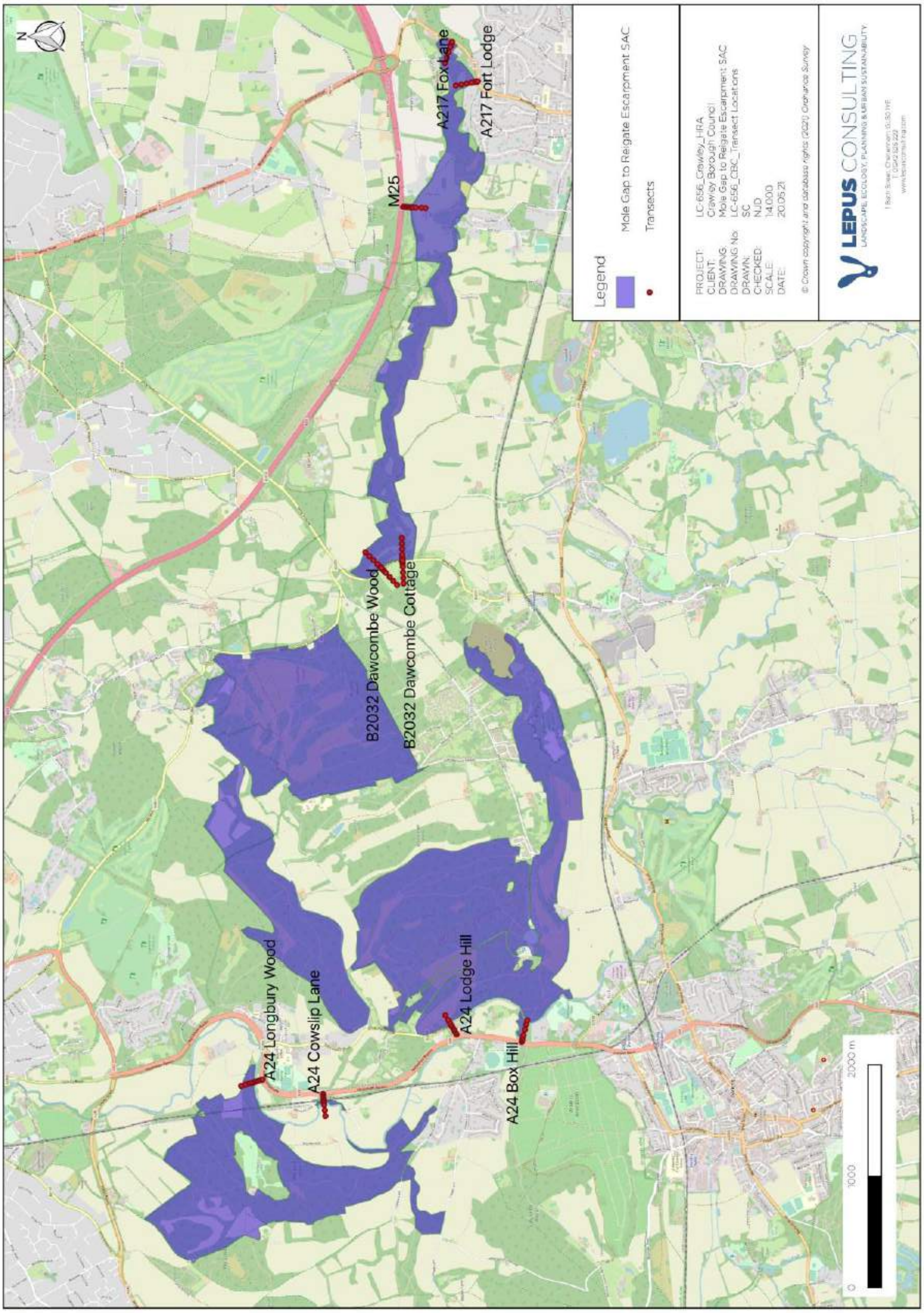

Figure 6.3: Air quality modelling transects at Mole Gap to Reigate Escarpment SAC

6.3.32 The air quality modelling focused on the following pollutants which are associated with traffic related emission sources:

- Nitrogen oxides (NOx);

- Ammonia (NH_3);
- Nutrient nitrogen deposition (N-dep); and
- Acid deposition (A-dep).

6.3.33 Nitrogen oxides (NOx) are produced during the combustion processes, partly from nitrogen compounds in the fuel, but mostly by direct combination of atmospheric oxygen and nitrogen in flames[84]. Road transport emissions of NOx in 2018 were the largest contributor to UK total emissions of NOx with most emissions related to diesel vehicles[85]. The introduction of catalytic converters has seen an overall reduction in emissions since 1990. NOx have the potential to impact habitats through direct toxicity and through their contribution to nitrogen deposition. The critical level for all vegetation types from the direct toxic effects of NOx has been set to 30 $\mu g/m^3$.

6.3.34 Ammonia originates from both natural and anthropogenic sources, with the main man-made source being agriculture. Other man-made sources of ammonia include industrial processes and vehicular emissions (from catalyst-equipped petrol vehicles and selective catalytic reduction on light and heavy goods diesel fueled vehicles). As with NOx, elevated levels of ammonia can be directly toxic to plants and can also enrich a system with nitrogen causing eutrophication and acidification effects on habitats.

6.3.35 Lichen species can be sensitive to even small increases in ammonia (1 $\mu g\ m^{-3}$)[86]. As such there are two critical levels for ammonia, 1 $\mu g\ m^{-3}$ for lower plants (lichens and bryophytes[87]) and 3 $\mu g\ m^{-3}$for higher level plants (all other vegetation). The air quality modelling has applied both thresholds, however only the lower threshold has been reported upon in the AQR. Modelling results have been compared to relevant critical levels within this assessment, depending on the presence of lichen and bryophyte interest in a particular area. This has been based on a review of available habitat survey data.

6.3.36 APIS describes nitrogen deposition as *the input of reactive nitrogen from the atmosphere to the biosphere both as gases, dry deposition and in precipitation as wet deposition*[88]. Anthropogenic sources of enhanced reactive nitrogen deposition come from emissions of oxidised nitrogen (NOx) and fossil fuel combustion and reduced nitrogen from agricultural sources.

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[84] Air Pollution Information Systems (2017) Pollutants, available at: https://www.apis.ac.uk/ [Date Accessed: 21/22/22]

[85] National Atmospheric Emissions Inventory. Available at: https://naei.beis.gov.uk/overview/pollutants?pollutant_id=6 [Date Accessed: 21/22/22]

[86] Air Pollution Information Systems. Pollutants. Available at: https://www.apis.ac.uk/ [Date Accessed: 21/22/22]

[87] *Lichens and mosses are at most risk as they have limited detoxification capacity relative to their uptake potential and a large surface area relative to mass.* Source: Air Pollution Information Systems. Pollutants. Available at: http://www.apis.ac.uk/overview/pollutants/overview_NH3.htm [Date Accessed: 21/22/22]

[88] APIS. Nitrogen Deposition. Available at: https://www.apis.ac.uk/ [Date Accessed: 21/22/22]

6.3.37 Nitrogen is a major growth nutrient for plants. An increase in nitrogen can be toxic to plants and can lead to eutrophication which can cause species loss and changes in the structure and function of ecosystems. Nitrogen can also cause acidification of soils, the effects of which are discussed in more detail below (see acidification section below). Traffic related inputs of NOx and ammonia have an impact on the rates of nitrogen deposition. Nitrogen deposition rates are habitat specific as different habitats have different tolerances to different levels. Where a critical load range is provided, the lower end of the range has been used in this screening assessment to ensure a precautionary approach has been taken.

6.3.38 Acidification comprises deposition of pollutants to soils which changes the pH level causing acidification. The contribution of SO_2 to acid deposition has reduced since the 1980s, with controls on transboundary emissions, so that the main contribution to acidification is from sources of oxidised and reduced nitrogen. The effect of acid deposition is indirect and related to the lowering of soil pH leading to reduced fertility and nutrient deficiencies, release of toxic metals and changes in microbial transformations[89]. As with nitrogen deposition, acid deposition rates are habitat specific.

6.3.39 The air quality modelling provided more detailed locally based air quality data. This allowed a comparison of the change in emissions against 1% of the individual pollutant critical load or level. This modelling data was used to provide an assessment of LSEs in the context of critical levels and loads, following Natural England's guidelines, against the 1% screening threshold.

6.3.40 Appendix A2 and A3 of the AQR, provides the outputs of the results against the 1% screening threshold. These results are summarised and interpreted in an ecological screening assessment provided in Appendix E.

6.3.41 Based on a review of air quality modelling data against Natural England's 1% screening threshold for each pollutant (Appendix E), air quality pathways of impacts at Mole Gap to Reigate Escarpment SAC, Ashdown Forest SAC and Ashdown Forest SPA have been screened in for further consideration in the HRA process.

6.4 Water

6.4.1 Urban development can reduce catchment permeability and the presence of drainage networks may be expected to remove runoff from urbanised catchments. This may result in changes to run off rates from urbanised areas to Habitats sites or watercourses which connect to them. Water mains leakage and sewer infiltration may also affect the water balance.

6.4.2 Urbanisation also has the potential to reduce the quality of water entering a catchment during the construction of a development through processes such as sedimentation, accidental spillage of chemicals and materials. Water quality may also be reduced through effluent discharges and pollution as well as an increased water temperature.

[89] The APIS. Acid Deposition. Available at: http://www.apis.ac.uk/overview/pollutants/acid-deposition [Date Sourced: 21/12/22]

6.4.3 Features for which a Habitats site is designated are often sensitive to changes in water quality and water quantity. Therefore, urbanisation affecting drainage streams which is connected to a Habitats site has the potential to adversely affect the features for which it is designated.

6.4.4 The Plan area lies within the Thames river basin. River basin's are split further into management catchments and the Plan area lies within the River Mole management catchment. The River Mole, a tributary of the River Thames, flows along the western boundary of the Plan area with a number of smaller watercourses throughout the Plan area, such as Gatwick Stream and Crawter's Brook, feeding into it.

6.4.5 Southern Water, SES Water and South East Water provide water supply for the Plan area. Wastewater treatment is provided by Crawley Wastewater Treatment Works (WwTW) which discharges to the River Mole. It is understood that some flow may also be pumped to Horley WwTW which also discharges to the River Mole.

6.4.6 As part of the evidence base to support the Local Plan a Gatwick Sub Regional Water Cycle Study (WCS)[90] was commissioned by Crawley Borough Council, acting on behalf of the councils in the Gatwick Sub-Region (Crawley Borough Council, Horsham District Council, Mid Sussex District Council and Reigate and Banstead Council).

6.4.7 The purpose of the WCS is to assess the potential issues relating to future development within the Gatwick Sub-Region and the impacts on water supply, wastewater collection and wastewater treatment. The WCS also provides an assessment of the impact on the aquatic environment and the quality and quantity of water at Habitats sites associated with development proposals in the Local Plan.

6.4.8 The WCS was undertaken through consultation with the Gatwick Sub-Region Authorities, water and wastewater utilities, the Environment Agency, Natural England, and where there were cross-boundary issues, with neighbouring local authorities

6.4.9 The WCS analysed a number of key potential hydrological impacts at Habitats sites from point and diffuse sources of pollution. Point sources included discharges from Waste Water Treatment Works (WwTWs). Diffuse sources of pollution included drainage from housing estates, runoff from roads and discharges from commercial and industrial premises.

6.4.10 The WCS identified possible water pathways of impact at the following Habitats sites on the basis of hydrological connectivity and the location of upstream WwTWs and as such these sites have been scoped into the assessment.

- Arun Valley SAC;
- Arun Valley SPA;
- Arun Valley Ramsar; and
- Mole Gap to Reigate Escarpment SAC.

[90] JBA Consulting (August 2020). Gatwick Sub-Region Water Cycle Study. Final Report.

6.4.11 The River Mole flows into the River Thames at Hampton Court, approximately 28.3km to the north of the Plan area and downstream of the South West London Waterbodies SPA. Due to the location of the River Mole's confluence with the River Thames downstream of the SPA, there are not likely to be any adverse impacts on the integrity of the South West London Waterbodies SPA or Ramsar due to water quality impacts associated with the development set out in the Local Plan either alone or in-combination. This site will therefore not be considered further in the HRA process in terms of hydrological change.

6.4.12 All other Habitats sites are not considered to be hydrologically linked to the Plan area either due to their location or because they are not considered to be sensitive to hydrological impacts. As such these sites have been scoped out of the HRA in terms of hydrological pathways of impact (including water quality and water quantity issues).

6.5 Functionally Linked Land

6.5.1 There are no Habitats sites located within the Plan area and therefore the Local Plan will not result in the direct loss of land within an area designated as a Habitats site. However, there is potential for the Local Plan to result in the loss of habitat outside a Habitats site. Supporting habitat, also referred to as functionally linked habitat[91], may be located some distance from a Habitats site. The fragmentation of habitats through the loss of connecting corridors would have the potential to hinder the movement of qualifying species.

6.5.2 A review of threats and pressures at each Habitats site identified a number of mobile qualifying features for Habitats sites within the study area (Section 5).

6.5.3 Background data highlights the sensitivities of Bechstein Bat roosting habitat at Mole Gap to Reigate Escarpment SAC to disturbance effects and the importance of maintaining commuting routes from roost into surrounding habitat and foraging areas.

[91] "*The term 'functional linkage' refers to the role or 'function' that land or sea beyond the boundary of a European site might fulfil in terms of ecologically supporting the populations for which the site was designated or classified. Such land is therefore 'linked' to the European site in question because it provides an important role in maintaining or restoring the population of qualifying species at favourable conservation status*". Source: Natural England. 2016. Commissioned Report. NECR207. Functional linkage: How areas that are functionally linked to European sites have been considered when they may be affected by plans and projects - a review of authoritative decisions.

6.5.4 The Bat Conservation Trust (BCT) notes that Bechstein's Bat is a species that is predominantly associated with broadleaved woodlands using stream corridors and hedgerows to commute to foraging areas[92]. The BCT has defined a number of species-specific Core Sustenance Zones (CSZ). These refer to the area surrounding a communal bat roost within which habitat availability and quality will have a significant influence on the reliance and conservation status of the colony using the roost. For Bechstein's Bat a CSZ of 1km is identified with moderate confidence. The BCT guidance therefore suggests that this CSZ should be increased to at least 3km to reflect the bat's specific habitat requirements[93]. As the Plan area is 9.6km from Mole Gap to Reigate Escarpment SAC at its closest point, it is therefore considered that functionally linked Bechstein's Bat habitat will not be affected by the Local Plan and this LSE has been scoped out.

6.5.5 Great Crested Newts are one of the qualifying species for the Mole Gap to Reigate Escarpment SAC and Ashdown Forest SAC. Whilst Great Crested Newts rely on water bodies to breed and during the aquatic stages of their life cycle, they are known to travel approximately 500m from their breeding pond habitat during the terrestrial phase of their lifecycle[94,95]. Depending on the location of the ponds within the SAC, terrestrial habitat may include land outside the SAC boundary. The Plan area is located at its closest point 9.6km from the Mole Gap to Reigate Escarpment SAC and approximately 9.8km from the Ashdown Forest SAC. Therefore, it is considered functionally linked Great Crested Newt habitat will not be affected by development set out in the Local Plan and can be scoped out.

6.5.6 Given the distance of the Plan area from Ashdown Forest SPA, and urban development between the SPA and Plan area, it is also considered unlikely that development set out in the Local Plan will have a LSE upon the bird species associated with Ashdown Forest SPA and this pathway of impact can be scoped out.

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[92] Bat Conservation Trust. 2016. Bat Surveys for Professional Ecologist. Good Practice Guidelines. Third Edition.

[93] Bat Conservation Trust. 2016. Core Sustenance Zone. https://cdn.bats.org.uk/pdf/Resources/Core_Sustenance_Zones_Explained_04.02.16.pdf?mtime=20190219173135&focal=none

[94] Natural England (2015) Great crested newts: protection and licences. Available at: https://www.gov.uk/guidance/great-crested-newts-protection-surveys-and-licences [Date Accessed: 15/12/22]

[95] Langton, T.E.S., Beckett, C.L., and Foster, J.P. (2001), Great Crested Newt Conservation Handbook, Froglife, Halesworth.

6.5.7 As set out in Section 5.8, Barbastelle Bats are a qualifying species for the Mens SAC. Research has indicated that this species of bat forage up to 7km from their roost sites within areas that lie to the east of The Mens SAC, principally on the floodplain of the River Arun[96]. This work notes that major threats to Barbastelle Bats include those affecting their roosts, foraging areas and connective landscape features between them, acknowledging that often these threats are indirect. The Plan area is located a significant distance from The Mens SAC (21.7km at its closest point) and therefore direct habitat loss and fragmentation impacts upon foraging or designated habitat is not likely. However, as noted in Section 6.4 functional hydrological linkages between the Plan area and the Arun Valley have been identified in the WCS. The Arun Valley provides Barbastelle Bat foraging habitat. Changes in water quality and quantity may have implications for wetland foraging habitat upon which Barbastelle Bats rely.

6.5.8 Habitat loss and fragmentation at the Mens SAC has been scoped into the HRA process as a potential impact pathway. All other Habitats sites have been scoped out.

6.6 Public access and disturbance

6.6.1 Public access and disturbance can take a number of forms. It can include both physical and non-physical disturbance, which can be caused by urbanisation pressures and increased recreational activity.

6.6.2 These activities can result in damage to habitats through erosion and compaction, troubling of grazing stock, spreading invasive species, cat predation, dog fouling, litter and fly-tipping, tree climbing, wildfire and arson, noise, vibration, light pollution and vandalism.

[96] Greenaway, F. 2008. Barbastelle bats in the Sussex West Weald 1997 – 2008.

Recreational Pressure

6.6.3 Across the UK, public access and disturbance threats at Habitats sites are often considered in terms of buffer distances. For recreational impacts, these are often determined through analysis of visitor and recreational survey data, baseline site information and take into consideration the proximity of new development.

6.6.4 As set out in Section 5, the following Habitats sites within the study area have been identified as being sensitive to increased recreational pressure from development.

- Ashdown Forest SPA;
- Mole Gap to Reigate Escarpment SAC; and
- South West London Waterbodies SPA.

6.6.5 Information contained in Natural England's SIP and Supplementary Advice[97] for Ashdown Forest SPA identifies public access and disturbance as a threat/pressure. This threat relates to the impact of public disturbance on the breeding populations of Nightjar and Dartford Warbler. Natural England's Supplementary Advice notes that disturbing effects can result in '*changes to feeding or roosting behaviour, increases in energy expenditure due to increased flight, abandonment of nest sites and desertion of supporting habitat (both within or outside the designated site boundary where appropriate)*. *Such disturbance has the potential to 'affect successful nesting, rearing, feeding and/or roosting, and/or may reduce the availability of suitable habitat as birds are displaced and their distribution within the site contracts'. Nightjar is a bird known to be sensitive to disturbance. Disturbance caused by human activity may take a variety of forms including noise, light, sound, vibration, trampling, presence of people, animals and structures*'. The Advice goes on to note that '*freely roaming dogs can exacerbate the disturbance caused by people visiting the site where they can inadvertently trample on, or flush, birds from their nest leaving chicks or eggs to die'*. Visitor surveys were undertaken in 2008 and 2016 to better understand the impact of visitor disturbance on Nightjar and Dartford Warbler populations.

6.6.6 The 2008 visitor survey was undertaken by UE Associates to investigate visitor access patterns and points of visitor origin at Ashdown Forest SPA[98]. Following this, further work was commissioned by Natural England in 2010 to determine the impact of visitors upon Nightjar and Dartford Warbler populations.

6.6.7 On the basis of this visitor survey work, the affected Local Planning Authorities (Wealden, Mid Sussex, Lewes, Tunbridge Wells, Tandridge and Sevenoaks, together known as the SAMMS Partnership) agreed to take a co-ordinated and consistent strategic approach to the collection of developer contributions required to fund mitigation in the form of access management and monitoring (Strategic Access Management and Monitoring Scheme (SAMMS)). This strategic approach was applied to an 'outer' zone of influence of 7km which was identified as the zone within which recreational impacts were considered to be most likely to impact the qualifying features of the SPA.

[97] Natural England 2019. Ashdown Forest SAC Conservation Objectives Supplementary Advice. http://publications.naturalengland.org.uk/file/6754256153739264 [Date Accessed 15/12/22].

[98] Ashdown Forest Visitor Survey UE Associates 2009

6.6.8 In 2016, an updated visitor survey was undertaken by Footprint Ecology to ensure the strategic approach was based upon up to date visitor survey data[99]. This indicated that dog walking (69%) was the most common activity undertaken on site. Postcode data was collected as part of this survey which allowed home origin location to be mapped. This showed a wide scatter of visitors across Sussex from London to the south coast. The average straight-line distance between the home location and the survey point was 8,402m (median 4,870m). A quarter (25%) of interviewees lived within 1,459m of the survey point and three quarters (75%) lived within 9,643m. Analysis of the results by Footprint Ecology indicated that the majority of frequent visitors originated from closer locations to Ashdown Forest, with 72% originating from Wealden (12% form Mid-Sussex and 5% from Tunbridge Wells). When filtering data for dog walkers only, Footprint Ecology found the visitor survey results indicated 79% of dog walkers come from Wealden. The 2016 survey indicated the 7km zone of influence still captured the majority of visitors and the majority of frequent visitors to the SPA and SAC.

6.6.9 In terms of Crawley specifically, the home postcode data indicated that 1 visitor out of a total of 434 visitors from home came from Crawley (i.e. 0.23% of all visitors originated from Crawley). The low number of Crawley residents visiting this site reflects the fact that there are a number of alternative locations for recreational activity both within and adjacent to the borough.

6.6.10 On the basis of the Footprint Ecology visitor survey data, the SAMMS partnership signed up to a Statement of Common Ground in 2019 to which Natural England, as the Statutory Consultee, was party. This establishes a 7km mitigation zone of influence within which developer contributions for new development are required to contribute to the implementation of SAMMS and also delivery of SANG where appropriate to mitigate adverse impacts on the integrity of Ashdown Forest SPA due to increased visitor pressure.

6.6.11 Crawley does not lie within the 7km zone of influence and at its closest point is located approximately 9.6km from the SPA. Given the location of Crawley outside of the 7km zone of influence, it is considered that recreational pathways of impact at Ashdown Forest SPA and SAC can therefore be scoped out.

6.6.12 Mole Gap to Reigate Escarpment SAC is accessible via several Public Right of ways (PRoWs). The North Downs Way National Trail runs in an east to west direction through the south of Mole Gap to Reigate Escarpment SAC. There are two car parks located to the east of the site and two car parks located to the south of the site including Box Hill Café and visitor centre.

[99] Liley, D., Panter, C. & Blake, D. (2016). Ashdown Forest Visitor Survey 2016. Unpublished report.

6.6.13 As part of the 2008 Mole Valley Local Development Framework (LDF) Appropriate Assessment[100] a review of visitor surveys undertaken in 2004 by the National Trust and in 2005 and 2006 by Bournemouth University was undertaken (see Appendix C of the Mole Valley Appropriate Assessment). Analysis of post code data from the National Trust surveys indicated that no visitors were recorded from Crawley. The outputs of the Bournemouth surveys indicate that the majority of people coming to the SAC were from further afield, with over 80% (82% at Headley, rising to some 93% at Reigate Hill/Gatton originating from over 5 miles away and over 54% (Headley), rising to 81% (Reigate Hill/Gatton) originating from over 15 miles away. The Mole Valley LDF Appropriate Assessment concluded that, on the basis of these surveys, recreational pressure at the Mole Gap to Reigate Escarpment SAC is focused mainly around honeypot sites, with the majority of impact being within a small radius of the car parks. The outputs of the studies also showed that, although there are local visitors to the sites, large numbers originate from over 15 miles (24.14km) and therefore the majority of recreational pressure is caused by visitors travelling from further afield.

6.6.14 A guidance note prepared by Mole Valley District Council acknowledges that there is already considerable recreational pressure, requiring high levels of management[101]. Further development beyond the borough boundary may increase the volume of visitors to the site, requiring careful management to ensure that no significant damage is caused to the important features of this Habitats Site. As a result of the Appropriate Assessment undertaken in support of Mole Valley's Local Development Framework (LDF), Policy CS15 of the LDF safeguards a buffer zone of 800m around the SAC. Within this area there is a presumption "*against any increase in residential or employment related development…unless its impact is mitigated*". Large development outside the 800m buffer zone is likely to attract significant visitor numbers and should consider the impacts upon the SAC and provide suitable mitigation[102].

6.6.15 At its closest point the Plan area lies within 9.4km of the SAC, which is considerably outside the 800m buffer. The honeypot sites are located 12.5km, 12.6km and 9.9km respectively from the Plan area. It is therefore considered that any impact of the Plan alone would have a negligible effect on Mole Gap to Reigate Escarpment SAC alone.

6.6.16 Given the large recreational draw of the SAC across London and the South East and the distance of the Plan area from the key car park locations (honeypot sites) it is considered likely that an in-combination visitor contribution from Crawley will be negligible. Recreational pathways of impact at Mole Gap to Reigate Escarpment SAC from the Local Plan can therefore be scoped out.

[100] Mole Valley District Council. 2008. Mole Valley Local Development Framework Mole Valley Appropriate Assessment.

[101] Mole Valley District Council (2012) Mole Gap to Reigate Escarpment SAC Guidance Notice, Available at: https://www.molevalley.gov.uk/sites/default/files/home/building-planning/local-plans/sacguidancefinal_0.pdf [Date Accessed: 15/12/22]

[102] Mole Valley District Council (2012) Mole Gap to Reigate Escarpment SAC Guidance Notice, Available at: https://www.molevalley.gov.uk/sites/default/files/home/building-planning/local-plans/sacguidancefinal_0.pdf [Date Accessed: 15/12/22]

6.6.17 All qualifying features of South West London Waterbodies SPA and South West London Waterbodies Ramsar, namely the habitats and non-breeding populations of Gadwall and Shoveler, are recognised as being under threat from public access associated disturbances.

6.6.18 A key environmental condition of South West London Waterbodies SPA and Ramsar is a lack of disturbance during the winter months of October to March. Disturbances of sufficient extent, intensity or duration can cause the Gadwall and Shoveler populations to abandon the site. Different waterbodies of the SPA offer different levels of access to the public, with some more restricted than others. Where possible, recreational use across much of the SPA is managed through the Potentially Damaging Operations Scheme. Any operations that may undermine the integrity of the SSSIs, which underpin the SPA, therefore require consent from Natural England. Given the location of this designation from the Plan area (29.6km to the north west of the Plan area), and the environmental controls currently in place, recreational pathways of impact at the Southwest London Waterbodies SAP and Ramsar can be scoped out.

6.6.19 Data presented in Natural England's SIP for the Mens SAC indicates that Barbastelle Bats are vulnerable to light pollution which may be caused by development. The Mens SAC is located approximately 21.7km to the south west of the Plan area at its closest point. Given this distance, light pollution can be scoped out.

Urbanisation Pressure

6.6.20 Urbanisation effects are caused where development is located close to a Habitats site designated boundary. These effects often include cat predation of ground nesting birds, lighting (illumination), visual disturbance, fly tipping, noise and vandalism. As with recreational impacts, urbanisation mitigation strategies have been implemented across the UK through the establishment of buffer zones. Commonly applied urbanisation zones of influence extend around 400m from the edge of a designation as this reflects likely impacts from pets (e.g. cat predation) and the distance from which people access a site on foot. The Thames Basin Heaths Special Protection Area Delivery Framework[103] is one such strategy which makes recommendations for accommodating development while also protecting the SPA's qualifying features by establishing a 400m zone where development does not take place.

6.6.21 Given no Habitats sites are located within the Plan area, or within 400m of a Habitats site, urbanisation pathways of impact can be scoped out.

[103] Thames Basin Heaths Joint Strategic Partnership Board (2009). Thames Basin Heaths SPA Delivery Framework. https://www.bracknell-forest.gov.uk/sites/default/files/2021-08/thames-basin-heaths-spa-delivery-framework.pdf [Date Accessed: 15/12/22].

6.7 Summary of threats and pressures

6.7.1 Table 6.5 provides a summary of threats and pressures which have been scoped into the HRA process for each Habitat sites taking into consideration a 'source-pathway-receptor' model. These will form the basis of the HRA screening assessment (Section 7).

Table 6.3: Scope of pressures and threats from the Local Plan at Habitats sites

Habitats sites	Air Pollution	Water	Functionally linked land	Public access/ disturbance
Mole Gap to Reigate Escarpment SAC	Vulnerable	Vulnerable	No threat or pressure	No threat or pressure
Ashdown Forest SAC and Ashdown Forest SPA	Vulnerable	No threat or pressure	No threat or pressure	No threat or pressure
South West London Waterbodies SPA and South West London Waterbodies Ramsar	No threat or pressure	No threat or pressure	No threat or pressure	No threat or pressure
Arun Valley SAC Arun Valley SPA Arun Valley Ramsar	No threat or pressure	Vulnerable	No threat or pressure	No threat or pressure
The Mens SAC	No threat or pressure	No threat or pressure	Vulnerable	No threat or pressure

7 Screening (HRA Stage 1)

7.1 Local Plan pre-screening

7.1.1 Following scoping of impact pathways (Section 6), each Local Plan policy has been appraised against the HRA pre-screening criteria (see Table 4.1), taking into consideration case law and best practice in order to screen for LSEs. Appendix F and Appendix G present the output of this screening exercise.

7.1.2 It is concluded that LSEs, either from the Local Plan alone or in- combination with other plans or projects, could be screened out for some elements of the Local Plan. This is because they fell into the following categories (see Table 4.1 for a description of each category):

- Category A: General statements of policy / general aspirations;
- Category B: Policies listing general criteria for testing the acceptability / sustainability of proposals;
- Category D: Environmental protection / site safeguarding; and
- Category F: Policies or proposals that cannot lead to development or other change.

7.1.3 A number of policies were however considered likely to have an LSE on the basis of this assessment as they fell into the following categories:

- Category I: Policies or proposals with a likely significant effect on a site alone;
- Category L: Policies or proposals which might be likely to have a significant effect in combination; and
- Category M: Bespoke area, site or case-specific policies or proposals intended to avoid or reduce harmful effects on a Habitats site.

7.1.4 Table 7.1 provides a summary of policies that have been screened in.

Table 7.1: Summary of screened in policies

Policy Number	Policy Name	Screening Category
EC1	Sustainable Economic Growth	Category I and L
EC4	Strategic Employment Provision	Category I and L
TC3	Town Centre Key Opportunity Sites	Category I and L
H1	Housing Provision	Category I and L
H2	Key Housing Sites	Category I and L
H8	Gypsy, Traveller and Travelling Showpeople Sites	Category I and L
SDC4	Water Neutrality	Category M

7.1.5 LSEs were identified at the following Habitats sites:

- Ashdown Forest SAC and SPA – air quality LSEs in-combination;

- Mole Gap to Reigate Escarpment SAC – air quality LSEs in combination;
- Mole Gap to Reigate Escarpment SAC – hydrology LSEs alone;
- Arun Valley SAC – hydrology LSEs alone;
- Arun Valley SPA – hydrology LSEs alone;
- Arun Valley Ramsar – hydrology LSEs alone; and
- The Mens SAC – habitat loss and fragmentation (at functionally linked land due to knock on hydrological LSEs) LSEs alone.

8 Appropriate Assessment: Ashdown Forest SAC and Ashdown Forest SPA – Air Quality

8.1 Introduction

8.1.1 The HRA screening process (Appendix F) has identified a number of components of the Local Plan with the potential to result in LSEs at Ashdown Forest SAC and Ashdown Forest SPA as a result of air pollution (see Table 7.1). All allocations set out in individual policies (Appendix G) also have the potential to have a cumulative and in-combination air quality effect.

8.1.2 The following Appropriate Assessment focuses on assessing more precisely the ecological impacts of air pollution at the SAC and SPA in view of their qualifying features and conservation objectives taking into account air quality information. This assessment follows Natural England's current guidance and therefore assesses the likely effects to inform a conclusion as to whether an adverse effect on site integrity can be ruled out. The following assessment also draws on Chartered Institute of Ecology and Environmental Management (CIEEM's) guidance following a six-step methodology. It includes consideration of factors such as[104]:

- The action needed to achieve the conservation objectives for the SAC and SPA;
- The expected future trend in pollutants of concern (and the scientific reasonableness of any trend);
- The magnitude of any future 'in combination' dose and how it may change the trend; and
- The physical extent of the affected area as a proportion of that interest feature within the Habitats sites.

8.2 Air Quality Threats at Ashdown Forest SAC and SPA

8.2.1 Section 5.2 and Section 5.3 provide an overview of Ashdown Forest and the qualifying features for which the SAC and SPA are designated. The conservation objectives of each designation are outlined in Appendix B.

8.2.2 Information contained in the SIP for Ashdown Forest SAC and SPA notes that the site is vulnerable to air pollution (see Appendix B), and in particular atmospheric nitrogen deposition. It notes that the wet heathland and European dry heaths are vulnerable to air quality impacts.

[104] CIEEM. January 2021. Paragraph 20. Advisory Note: Ecological Assessment of Air Quality Impacts

8.2.3 Natural England's Supplementary Advice for the SAC notes that in term of air quality, the target should be to '*restore as necessary, the concentrations and deposition of air pollutants to at or below the site-relevant Critical Load or Level values given for this feature of the site on the APIS'*[105].

8.2.4 Information in the Supplementary Advice goes on to note the following: *'Modelling undertaken by Wealden District Council, Lewes District Council and other relevant Local Planning Authorities for Local Plan assessments has identified that increases in development coming forward within plans, would increase Nitrogen deposition, Nitrogen Oxides and ammonia adjacent to roads that run through Ashdown Forest from associated increased transport. However, assessment of improvements in vehicular technology and in particular Euro6/VI standards that all vehicles are currently being manufactured to, will outweigh impacts from new development. The improvements will be marginally retarded by additional development, but future nitrogen deposition and concentration will continue to decline with the existing trend.*

8.2.5 *The site exceeds the critical load/level however Natural England Commissioned Report 210 identifies that expected increase in Nitrogen levels from additional transport would fall below the level that would reduce species richness on the site even if the expected declining trend in Nitrogen failed to materialize.*

8.2.6 *The background levels of Nitrogen are expected to decline with EU and Government clean air strategies and continue the existing downward trend. Notwithstanding the above, large inputs from industrial processes that could disperse over greater distances or large increases in vehicular movements not included within Local Authority modelling would need to be assessed separately for potential impacts on the site.*

8.2.7 *Source attribution data on APIS identifies that agriculture is contributing to ammonia (and thus Nitrogen) concentrations and deposition'.*

8.2.8 According to the Supplementary Advice for the SPA '*the structure and function of the habitats which support this SPA feature may be sensitive to changes in air quality. Exceeding critical values for air pollutants may result in changes to the chemical status of its habitat substrate, accelerating or damaging plant growth, altering vegetation structure and composition. Increased development is likely to result in increased traffic on the roads that cross the SPA. However, the resultant vehicular air emissions will not significantly retard the background improvements that are expected as a result of improvements in vehicular technology and from the Government Clean Air Strategy. Additionally, minor habitat changes are not considered to be a threat to the SPA population as it is the broad structure and function of the habitat that supports the SPA features that is considered more relevant*[106]*.*

8.2.9 The SPA however has the same target as the SAC in respect of air quality: '*Restore concentrations and deposition of air pollutants to at or below the site-relevant Critical Load or Level values given for this feature of the site on the APIS*'.

[105] Natural England 2019. Ashdown Forest SAC Conservation Objectives Supplementary Advice. http://publications.naturalengland.org.uk/file/6494201252675584 [Date Accessed 15/09/20].

[106] Natural England 2019. Ashdown Forest SPA Conservation Objectives Supplementary Advice. http://publications.naturalengland.org.uk/file/675425615373926 [Date Accessed 15/09/20].

8.2.10 The qualifying features of the SPA are the breeding populations of Dartford Warbler and Nightjar. It is noted that these species of bird depend upon the heathland habitat which is covered by the SAC designation. As such, these species of birds are sensitive to any air quality impacts in so much as they impact the heathland habitat present within the SAC. This assessment of air quality impacts therefore focuses on the impacts due to changes in air quality as a result of the Local Plan (alone and in-combination) at the features of the SAC.

8.3 Ashdown Forest Statement of Common Ground

8.3.1 Crawley Borough Council is an active member of the Ashdown Forest Working Group (AFWG) and a signatory of the Ashdown Forest Statement of Common Ground (SoCG)[107]. The purpose of the SoCG is to address the strategic cross boundary issue of air quality impacts on the Ashdown Forest Special Area of Conservation (SAC) arising from traffic associated with new development. It provides evidence on how the authorities have approached the Duty to Co-operate, clearly setting out the matters of agreement and disagreement between members of the AFWG.

8.3.2 The Ashdown Forest Working Group is in the process of agreeing new joint approaches for transport modelling and air quality monitoring. This is also anticipated to include a joint approach to air quality modelling. These will be set out in an updated SoCG in due course. Crawley Borough Council is a committed and active member in the AFWG. The Council supports and is contributing towards the emerging joint work and this will inform the preparation of Local Plan Reviews in the future.

8.3.3 The approach taken to the assessment of air quality impacts at Ashdown Forest SAC in this HRA is compliant with the current version of the SoCG.

8.3.4 As set out in the current SoCG, taking a precautionary approach, for screening it is assumed that pristine heathland qualifying habitat is present, or could be present in the future, at any point on the modelled transects irrespective of existing habitat at that location. However, it is recognised that in practice there are affected areas in which heathland is not present and may never be present and this has been taken into consideration in the Appropriate Assessment (where screening thresholds have been exceeded) through an ecological interpretation of results.

8.4 Mitigation

8.4.1 It is anticipated that the following policies, which form the Local Plan will have a positive impact and contribute towards the mitigation of air quality impacts from traffic sources at the SAC and SPA. The Appropriate Assessment in respect of air quality therefore takes these into consideration.

- SD1: Presumption in Favour of Sustainable Development – This sets out the requirement for development to maximise the use of sustainable travel.

[107] The South Downs National Park Authority, Chair of the Ashdown Forest Working Group. Ashdown Forest Statement of Common Ground. April 2018. Available at: https://www.lewes-eastbourne.gov.uk/_resources/assets/inline/full/0/286630.pdf [Date Sourced: 21/12/22]

- SD2: Enabling Healthy Lifestyles and Wellbeing – This policy aims to mitigate the impact of traffic related air pollution by promoting sustainable transport options.
- CL1 Neighbourhood Principle – This policy encourages provision of facilities within walking distance.
- CL3: Movement Patterns, Layout and Sustainable Urban Design – This policy aims to connect, enhance and extend sustainable movement and encourage walking and cycling.
- CL4: Compact Development – Layout, Scale and Appearance – This policy encourages best use of land to encourage a modal shift and take account of sustainable transport options.
- OS3: Rights of Way and Access to the Countryside – This policy protects and promotes right of access to the countryside to encourage walking.
- IN2: The Location and Provision of New Infrastructure – This policy promotes the provision of facilities in sustainable locations which are accessible by a variety of means of transport.
- EC4: Strategic Employment Location – This policy promotes maximisation of sustainable site access and use of sustainable forms of transport.
- GI1: Green Infrastructure – This policy promotes use of green infrastructure for walking and cycling.
- EP5: Air Quality – This policy promotes protection of air quality for human health and the wider environment, the requirement for air quality assessments, and promotes the provision of facilities for sustainable transport including electric vehicle charge infrastructure and charge points.
- ST1: Development and Requirements for Sustainable Transport – This policy aims to ensure that development promote a modal shift away from the private car. It sets out requirements for transport statements, assessments and travel plans.
- ST2: Car and Cycle Parking Standards – This policy sets out requirements for cycle parking and provision of electric vehicle charging infrastructure.
- ST3: Improving Rail Stations – This policy promotes improvements at rail stations and sustainable access to these.

8.4.2 In addition, a number of local initiatives are intended to reduce the reliance on the private car and promote sustainable transport options. These are outlined below.

- Crawley's Transport Strategy – New Directions for Crawley[108] - sets out a strategy for sustainable transport in Crawley. It outlines a vision which will feed into the development of a detailed action plan up to 2030. It promotes walking and cycling options, use of digital technology to facilitate sustainable transport use, a Crawley electric car club and charging points, bike rental and improved accessibility to existing sustainable transport options.

[108] Crawley Borough Council. 2020. New Directions for Crawley. Available at: https://crawley.gov.uk/sites/default/files/2020-10/New%20Directions%20for%20Crawley%202020.pdf [Date Accessed: 20/12/22]

- The Local Cycling and Walking Infrastructure Plan (LCWIP)[109] is a costed plan which identifies and prioritises physical infrastructure improvements in a specified area to enable a significant increase in cycling and walking. It has informed the Local Plan, guiding development. It will provide a clear rationale for investment to make streets safe and attractive for active travel and for collaborative working with the local transport authority (West Sussex County Council).

8.4.3 These local initiatives will feed into the wider aspirations of the West Sussex Transport Plan[110]. Its aims for Crawley are to promote a shift to sustainable modes of transport (through improvements to bus priorities, improved public transport interchanges and rail services), enhance active travel options (walking and cycling), deliver air quality improvements, provide elective vehicle infrastructure and manage on street parking and implement traffic management techniques.

8.4.4 Acting together, the Local Plan policies, local and wider county initiatives will promote sustainable transport options with reductions in reliance on the private car and associated reductions in traffic emissions. These policies will be applied in the appropriate assessment of air quality impacts at Ashdown Forest SAC.

8.5 Appropriate Assessment of Air Quality at Ashdown Forest SAC

8.5.1 As noted in Section 6.3, air quality modelling was commissioned to better define air quality impacts and is reported upon in the AQR (Appendix D)[111]. Transects included in the air quality modelling for Ashdown Forest are shown in Figure 6.2. The outputs are presented by the following pollutants; nitrogen oxide, ammonia, nitrogen deposition and acid deposition.

Nitrogen Oxides

8.5.2 Data on APIS indicates that current baseline NOx levels are below the 30μg/m^3 for critical level, with an average concentration of 9.67μg/m^3 and a maximum concentration of 11.69μg/m^3 [112]. Trend data shows that NOx concentrations have fallen since 2014[113]. This is likely to be due to improved abatement of point source emissions, such as power stations, and improved vehicle emissions technology[114].

[109] Crawley Borough Council. 2020. Local Cycling and Infrastructure Plan. Available at: https://crawley.gov.uk/sites/default/files/2021-04/Local%20Cycling%20and%20Walking%20Infrastructure%20Plan.pdf [Date Accessed: 20/12/22]

[110] West Sussex County Council. 2022. West Sussex Transport Plan 2022 - 2036. Available at: https://www.westsussex.gov.uk/about-the-council/policies-and-reports/roads-and-travel-policy-and-reports/west-sussex-transport-plan/ [Date Accessed: 12/01/23]

[111] Air Quality Consultants. April 2021. Crawley Borough Council Local Plan Air Quality Assessment.

[112] APIS. Available at: https://www.apis.ac.uk/ [Date Accessed: 22/12/22]

[113] APIS. NOx trend data at Ashdown Forest SAC. Available at: https://www.apis.ac.uk/ [Date Accessed: 22/12/22].

[114] CIEEM. January 2021. Advisory Note: Ecological Assessment of Air Quality Impacts

8.5.3 The air quality modeling shows that there will be a large future reduction in NOx concentrations when compared to 2015 baseline levels at all receptors, with a halving of concentrations in most cases.

8.5.4 The modelling results also show that at all receptors in the future, NOx is below the critical level of 30μg/m^3 for all modelled scenarios with the exception of an area within 4m of the road edge at the A22/A275, 2m of the A275, 4m of the A22 Southern Section and 1m of the A26. Trend data shows that NOx has reduced over time and it is considered that this will continue to do so with improvements in vehicle emissions technology and from the Government Clean Air Strategy[115]. It is noted that the Clean Air Strategy has not been taken into consideration in the modelling.

8.5.5 Given the critical level is only exceeded for small number of receptors immediately adjacent to the road edge in a future do minimum and do something scenario, and taking into consideration the improvement in trend data, direct toxicity is not likely to have an adverse impact on the qualifying features of the SAC and habitats upon which the qualifying species of the SPA rely. However, it is necessary to consider the contribution of NOx to nitrogen deposition further through the Appropriate Assessment. This will allow a habitat specific assessment of potential impacts associated with emissions.

Ammonia

8.5.6 In terms of the SAC, data on APIS applies the critical level of 1μg m^{-3} for North Atlantic wet heaths and European dry heaths, as heathland has the potential to support a diverse terricolous lichen flora provided the sward is sufficiently open for colonisation. Data on APIS notes that this lower level is applied due to the assumption that bryophytes and lichen interest is present somewhere within the SAC.

8.5.7 A review of the underpinning SSSI citation for the SAC (Ashdown Forest SSSI) indicates that the dry heathland important lichen communities includes species such as *Pycnothelia papillaria*[116]. However, it is noted that the presence of lichen communities will be affected by other factors such as site management and recreational pressure.

8.5.8 A review has therefore been undertaken of the habitat types within the vicinity of modelled transects which also identifies the closest area of qualifying habitat (wet and dry heaths). This review was based on a habitat mapping commissioned by Wealden District Council using Earth Observation (satellite imagery and airborne systems) and commissioned site vegetation surveys[117]. The output of this review is presented below in Table 8.1. Table 8.2 provides a review of of ammonia concentrations at areas of qualifying habitat based on habitat types set out in Table 8.1.

[115] DEFRA. 2019. Clear Air Strategy 2019. Available at: https://www.gov.uk/government/publications/clean-air-strategy-2019 [Date Accessed: 22/12/22].

[116] Natural England. Ashdown Forest SSSI Citation. Available at: https://designatedsites.naturalengland.org.uk/PDFsForWeb/Citation/1001983.pdf [Date Accessed: 22/12/22]

[117] Ecus Ltd. July 2018. Ecological Monitoring at Ashdown Forest: Considering the Current and Future Impacts on the SAC caused by Air Quality and Nitrogen Deposition. Available at: https://www.wealden.gov.uk/planning-and-building-control/planning-policy/planning-policy-evidence-base/habitat-regulations-assessment/ [Date Accessed: 22/12/22].

Table 8.1: Ashdown Forest SAC - Habitat types at road transects and closest area of qualifying wet and dry heath habitat

Transect	Habitat Type
A22 (north) - Kidbrooke Wood	Dominated by semi natural woodland with some scattered bracken. Closest area of wet dwarf shrub heath is at 150m from the road edge in the southern transect only.
A22 (north) - Stone Quarry House	Dominated by semi natural woodland with some scattered bracken. Closest area of wet and dry dwarf shrub heath is at 115m from the road edge in the eastern transect only.
A22 (north) - Hindleap Warren	Dominated by semi natural woodland with some scattered bracken. Closest area of wet and dry dwarf shrub heath is at 50m from the road edge in the western transect only.
A22/A275 Junction	Semi natural woodland.
A22/A275 South Junction	Semi natural woodland.
A275	Dominated by scattered bracken and wet and dry dwarf shrub heath. Dry dwarf shrub heath is located at the roadside on both sides of the carriageway and scattered throughout the modelled transect. Wet dwarf shrub heath is located within 4m of the road site on both sides of the carriageway and scattered throughout the modelled transect. Bare ground and ephemeral / short perennial vegetation along the edge of the eastern carriageway. Semi natural woodland dominates to the west at approx. 50m from the road edge.
A22 (south) - West Wood	Note: the eastern transect is not located within the SAC designation and therefore there is no Ecus habitat mapping for this location (it is located within the SPA designation area). A review of aerial mapping data suggests that it is dominated by semi natural woodland. To the west. Built up habitat (a car park) is located to the immediate west of the road link for approx. 11m Dominated by scattered bracken and semi natural woodland. Wet dwarf shrub heath is located approx. 50m from the road edge, with wet and dry shrub heath scattered from 100m from the road edge.
A22 (south) - Milbrook Farm	Dominated by dry and wet dwarf shrub heath and scattered bracken. Both dry and wet dwarf shrub heath within a few metres of the road edge and scattered throughout the transect both to the west and east of the carriageway.
A22 (south) - Little Birch Wood	Semi natural woodland.
A26 – Poplar Farm	Dominated by semi natural woodland. Area of dry heath from 155m from the road edge.
A26 – Owl House	Dominated by semi natural woodland and bracken. Area of dry heath at approx. 150m – 200m from the road edge.
A26 – Poundgate	Dominated by semi natural woodland. Areas of dry heath located at approx. 122m from the road edge extending northwards.

Table 8.2: Ashdown Forest SAC – Review of ammonia concentrations at areas of qualifying habitat based on above habitat data (Table 8.1)

Transect	Review of ammonia concentrations at closest area of dry or wet dwarf shrub heathland
A22 (north) - Kidbrooke Wood	Wet heath at 150m from road edge to the south. In the 2035 do something scenario, the ammonia level falls below 1μg m^{-3} from 50m from the road edge and is therefore below the critical load at the closest area of heathland.
A22 (north) - Stone Quarry House	Wet and dry heath at approx. 115m from road edge in eastern transect. In the 2035 do something scenario, the ammonia level falls below 1μg m^{-3} from 50m from the road edge and is therefore below the critical load at the closest area of heathland.
A22 (north) - Hindleap Warren	Wet and dry heath at approx. 50m from road edge in eastern transect. In the 2035 do something scenario, the ammonia level falls below 1μg m^{-3} from

Transect	Review of ammonia concentrations at closest area of dry or wet dwarf shrub heathland
	50m from the road edge and is therefore below the critical load at the closest area of heathland.
A22/A275 Junction	This transect is dominated by semi natural woodland. There is no heathland.
A22/A275 South Junction	This transect is dominated by semi natural woodland. There is no heathland.
A275	Dry dwarf shrub heath is located at the roadside on both sides of the carriageway and scattered throughout the modelled transect in this area. Wet dwarf shrub heath is located within 4m of the road site on both sides of the carriageway and scattered throughout the modelled transects in this area. In the 2035 do something scenario, the ammonia level remains above the 1μg m^{-3} throughout the transect (a maximum level of 2.9μg m^{-3} at roadside in the eastern transect). It is noted that levels do not rise above the higher range critical load threshold of 3μg m^{-3}. The contribution of the Local Plan to these levels is so low that they are shown in the modelling to be 0.0μg m^{-3} at the closest area of heath habitat (from 3m from the road edge in the eastern transect and from 1m for the western transect. The greatest in-combination contribution is 1μg m^{-3}.
A22 (south) - West Wood	Wet heath at approx. 50m from road edge in western transect and both wet and dry heathland from 100m. In the 2035 do something scenario, the ammonia level falls below 1μg m^{-3} from 50m from the road edge and is therefore below the critical load at the closest area of heathland.
A22 (south) - Milbrook Farm	Wet and dry dwarf shrub heath is located from approx. 2m on both sides of the carriageway and scattered throughout the modelled transect in this area. In the 2035 do something scenario, the ammonia level remains above the 1μg m^{-3} to 100m in the western transect (a maximum level of 1.9μg m^{-3}) and 100m on the eastern transect (a maximum level of 2.6μg m^{-3}). It is noted that levels do not rise above the higher range critical load threshold of 3μg m^{-3}. The contribution of the Local Plan to these levels is so low that they are shown in the modelling to be 0.00μg m^{-3}. The greatest in-combination contribution is 0.19μg m^{-3}.
A22 (south) Little Birch Wood	This transect is dominated by semi natural woodland. There is no heathland.
A26 – Poplar Farm	Dry heath at approx. 155m from road edge in eastern transect. In the 2035 do something scenario, the ammonia level does not rise above 1μg m^{-3} in at any receptor and therefore is below the critical load at the closest area of heathland.
A26 – Owl House	Dry heath at approx. 150m from road edge. In the 2035 do something scenario, the ammonia level falls below 1μg m^{-3} from 50m from the road edge and is therefore below the critical load at the closest area of heathland.
A26 – Poundgate	Wet and dry heath at approx. 122m from road edge in eastern transect. In the 2035 do something scenario, the ammonia level falls below 1μg m^{-3} by 100m from the road edge and is therefore below the critical load at the closest area of heathland.

8.5.9 Application of the 1μg m^{-3} critical level shows that the closest areas of qualifying habitat to the road links modelled (with one exception, the A275) would not be in an area where this is exceeded. As such, there would be no direct toxicity on the qualifying features of the SAC at any of these transect locations. On the A275 however there are a number of receptors within an area where the 1μg m^{-3} critical load is exceeded at qualifying habitat. There is no exceedance of the higher critical load range (3μg m^{-3}) at any receptor location within 200m of the A275.

8.5.10 As noted above, the critical level of 1μg m^{-3} for heathland is applied where it has the potential to support a diverse terricolous lichen flora. Data on APIS assumes that bryophyte and lichen interest is present somewhere within the SAC and takes a precautionary approach, applying this lower level. However, it is noted that this is not always the case on the ground, as a diverse lichen community is reliant on a sufficiently open structure which is needed for lichen colonisation.

8.5.11 Monitoring of vegetation communities was undertaken on behalf of Wealden District Council by Ecus[118]. This included surveys undertaken in 2014, 2015 and 2016. Among other variables the percentage cover of all ground bryophytes and lichen was recorded. Eight of the transects (A, B, C, D, H, I, J, L) included areas of dry heath habitat. Purple moor grass was noted to be a common component of the heathland, along with other grasses including mat grass (*Nardus stricta*), bents (*Agrostis spp*.) and fescues (*Festuca spp*.). Bryophytes and lichens were not frequently recorded, being prevalent only in areas around transects B (on the B2026), E (on New Road (a minor road link between the A26 and B2026)) and H (Crowborough Road (a minor road which links the B2026 and the A22)). Transect locations B, E and H are not located in close proximity to the transects modelled in the air quality assessment and in particular are not located close to the A275. This suggests that there is no significant assemblage of terricolous heathland lichens adjacent to any of the modelled road links undertaken as part of this study. As such it is considered that in most instances the application of the higher critical load threshold of 3μg m^{-3} is appropriate for the roadside locations at Ashdown Forest SAC. It is noted that more diverse lichen assemblages are likely to be associated with areas of heathland which are managed to ensure a more open structure with less scrub and shrub encroachment.

8.5.12 The air quality modelling indicates that in a do something scenario there are no exceedances of the higher critical level of 3μg/m^3 in any of the future scenarios. This suggests that direct toxicity will not have an LSE on the qualifying features of the SAC.

8.5.13 However, the modelling shows there is an overall increase in levels at a number of transect locations in the 2035 do something scenario when compared to both the 2015 baseline and 2035 do nothing scenario.

8.5.14 Trend data shows that ammonia concentrations have increased since 2006. Information on APIS notes that as '*the climate warms, volatilisation of ammonia emissions will lead to a further rise in ammonia concentrations'* and that agriculture sources of ammonia are often associated with intensive dairy farming. Current levels of ammonia are at 2.12μg/m^3 on average across the site for both qualifying habitat types.

8.5.15 Whilst the upper critical level is not exceeded for the Local Plan alone or in-combination, it is necessary to consider the contribution of ammonia to nitrogen deposition and acid deposition further through the Appropriate Assessment. This will allow a habitat specific assessment of potential impacts associated with emissions.

[118] Ecus. 2018. Ecological Monitoring at Ashdown Forest: Considering the Current and Future Impacts on the SAC caused by Air Quality and Nitrogen Deposition. Available at: https://www.wealden.gov.uk/UploadedFiles/Ecological_Monitoring_At_Ashdown_Forest_Report.pdf [Date Accessed: 13/05/21]

Nitrogen deposition

8.5.16 Nitrogen deposition rates are habitat specific as different habitats have different tolerances to different levels. Section 6.3 summarises the critical loads and current nitrogen deposition at the SAC. There is one heathland critical load range for the SAC of 10-20 kgN/ha/yr. The lowest part of this range has been used for this assessment as it provides a precautionary approach.

8.5.17 Appendix A.2 of the AQR (Appendix D) provides modelled results for nitrogen deposition at each road link for the baseline scenario (2015) and a future (2035) modelled do nothing, do minimum and do something scenario.

8.5.18 As noted in Section 6.3, background levels of nitrogen deposition are within the critical load range (10-20 kg/ha/yr) for each qualifying feature. However, there is a background exceedance of the lower critical load range at the SAC (19.5kg/ha/yr). Any increase in nitrogen deposition as a result of traffic emissions from the Local Plan, alone or in-combination, has the potential to have an adverse impact on site integrity (AIOSI) at the SAC.

8.5.19 In order to assess the impact from increased nitrogen deposition, an Appropriate Assessment and ecological interpretation has been undertaken in compliance with best practice methodology following CIEEM's step-wise approach. This is outlined below

Step 1: Identifying the Baseline Ecological Features and Air Quality Levels

8.5.20 The baseline ecological features and current air quality levels at these features are presented in Section 6.3.

Step 2: Assessing Confounding Factors, Background Pollution Trends and the Sensitivity of the Receptor

8.5.21 A review of the APIS data for the SAC indicates that nitrogen deposition to both forest and short vegetation has declined between 2004 and 2018. This may be as a result of a number of factors including improved vehicle emissions and national uptake of cleaner technology[119]. This trend is reflected in the air quality modelling undertaken which shows an improvement from the 2015 baseline modelling when compared to the 2035 do nothing scenario, with the exception of receptors located within 20m of the road edge along the A26 (Owl House and Poundgate transects). However, data on APIS shows a rise in deposition between 2018 and 2019.

8.5.22 Data on APIS provides details on local contributions to nitrogen deposition from sources in the UK. This indicates that livestock is a significant contributor to nitrogen deposition representing 35.1% of the overall contribution (Figure 8.1). By comparison road transport represents 7.49% of overall contributions.

[119] CIEEM. January 2021. Advisory Note: Ecological Assessment of Air Quality Impacts

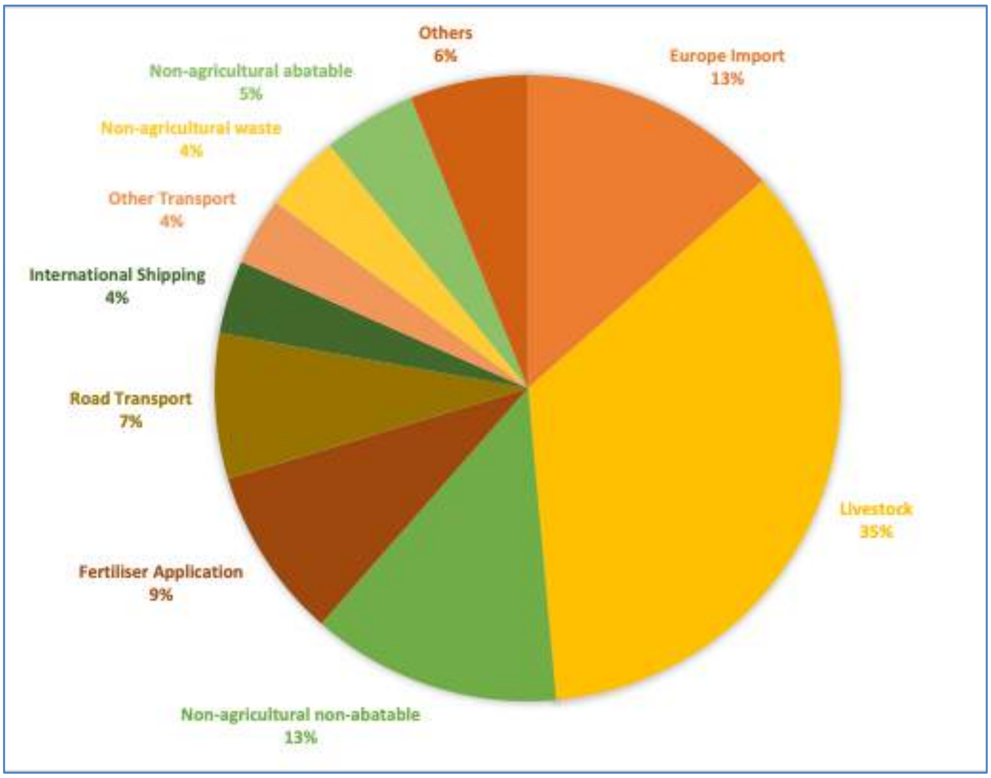

Figure 8.1: Local Contribution to Nitrogen deposition (Kg N/ha/yr) from sources (UK)[120] at Ashdown Forest SAC-

8.5.23 The site is vulnerable to air pollution[121]. A review of SSSI management unit data indicates that of the 127 SSSI units which underpin the SAC, 26 are in a favourable conservation status (Appendix C). Some 90 units are in an unfavourable recovering status predominantly due to storm damage, management of woodland and scrub control in woodland areas and in grassland habitat due to recreational pressures and scrub control. One unit is classed as being of an unfavourable - declining status due to deer grazing / browsing, forestry and woodland management and lack of corrective works and inappropriate scrub control. No unfavourable status classification is attributed to poor air quality which supports the conclusion reached in the SIP.

8.5.24 Natural England's Supplementary Advice[122] notes that the target for air quality is to maintain or restore as necessary the concentrations and deposition of air pollutants to at or below the site-relevant critical load or level values given for the qualifying features of the site on the APIS.

8.5.25 Nitrogen deposition is mapped on the APIS for six 5km by 5km grid squares across the SAC. A review of baseline nitrogen deposition levels for all qualifying features indicates relatively consistent levels of deposition across the SAC.

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[120] APIS. Source Attribution Data. Available at: http://www.apis.ac.uk/srcl/source-attribution?submit=Source+Attribution&sitetype=SAC&sitecode=UK0030080&sitename=Ashdown+Forest [Date Sourced: 22/12/22]

[121] Natural England. 2014. Site Improvement Plan. Ashdown Forest SPA and SAC. http://publications.naturalengland.org.uk/file/6679502935556096 [Date Accessed: 14/12/22].

[122] Natural England 2019. Mole Gap to Reigate Escarpment SAC Conservation Objectives Supplementary Advice. http://publications.naturalengland.org.uk/file/6354450398838784 [Date Accessed 21/12/22].

Step 3: Is the Critical Load or Level Exceeded?

8.5.26 The air quality modelling indicates that there is an exceedance of critical loads for all qualifying features of the SAC for future forecast scenarios at the majority of receptors (Appendix E).

8.5.27 The modelling shows that there is an average future do nothing deposition of nitrogen to grassland vegetation (which is considered to be representative of heathland habitat height for short vegetation) of 15kg N/ha/yr.

8.5.28 The future do-nothing scenario is a hypothetical scenario which assumes no traffic growth between 2015 and 2035 but allows for improvements in vehicle technologies and therefore a corresponding improvement in emissions. The modelling data indicates that there will be an overall reduction in nitrogen deposition levels when comparing the 2015 baseline condition to the future modelled 2035 do nothing scenario. This trend is reflected at all transects and receptors with the exception of those noted below.

8.5.29 A detailed analysis of critical levels at each road link is provided below.

A22/A275 Junction and A275 South Junction Transect

8.5.30 Habitat along the A22/A275 and A275 South Junction transect is dominated by semi-natural woodland. The lowest critical load ranges for wet and dry heath (10kg N/ha/yr) is exceeded at all receptor locations within these transects for all future scenarios.

8.5.31 The results show that nitrogen deposition reduces for the 2035 do minimum and do something scenarios when compared to the 2015 baseline at all locations.

A275

8.5.32 Habitat along the A275 comprises a mixture of scattered bracken and wet and dry heathland. The lowest critical load range for dry and wet heath (10kg N/ha/yr) is exceeded at all receptor locations for all scenarios.

8.5.33 Nitrogen deposition reduces for the majority of receptors for the 2035 do minimum and do something scenarios when compared to the 2015 baseline at both transects at all receptor locations. The exceptions are receptors within 5m of the road edge, where levels increase.

A22 (South Section)

8.5.34 Habitat along the A22 comprises semi natural woodland, scattered bracken and scattered dry and wet heath. The lowest critical load ranges for dry and wet heath (10kg N/ha/yr) are exceeded at all receptor locations within these transects for all scenarios.

8.5.35 Nitrogen deposition reduces for the 2035 do minimum and do something scenarios when compared to the 2015 baseline at all transects and locations.

A26

8.5.36 Habitat along the A26 predominantly comprises semi natural woodland close to the roadside, with scattered bracken, wet and dry heath further into the SAC designation. The lowest critical load ranges for dry and wet heath (10kg N/ha/yr) are exceeded at all receptor locations within these transects for all scenarios.

8.5.37 Nitrogen deposition reduces for the 2035 do minimum and do something scenarios when compared to the 2015 baseline at all transects and locations except for those within 20m of the road edge at the Owl House transect and 15m of the road edge at the Poundgate transect.

Step 4: Apply Critical Loads and Critical Levels with Expert Judgement

8.5.38 As noted above, exceedances of critical loads for nitrogen deposition may modify the chemical status of the substrate, accelerating or damaging plant growth, altering its vegetation structure and composition and causing the loss of sensitive typical species associated with it.

8.5.39 Heathland is particularly sensitive to changes in nitrogen deposition as it is often poor in nutrients. Effects can include changes in species composition, dominance of grasses, reduction in lichen, changes to plant biochemistry and increases in sensitivity of species to stress[123].

8.5.40 The work undertaken by Ecus on behalf of Wealden District Council notes that one of the first effects caused by an increase of nitrogen deposition is an increase in overall plant biomass[124]. This can be seen in an increase in above ground growth of heather. The indirect impact of this is the shading out of lower-growing species, especially mosses and lichens. Lichens and mosses are also vulnerable to the direct toxic effects of nitrogen deposition through absorption. The tissue of higher-level plans (such as heather) can also be affected by the toxic effect of elevated nitrogen which may lead to reduction in heath cover and out competition by other species such as bracken and purple moor grass. The Ecus work however notes that even under moderate levels of stress, plant communities do not exhibit rapid changes in species richness and composition. This is because current communities are a reflection of long terms changes in nitrogen deposition.

8.5.41 The level of nitrogen deposition from the Local Plan alone at all links, except for the A22/A275 junction, the A275 and the A26 at the Poundgate and A22 Little Birch Wood transects within 3m, is below the 1% threshold and is therefore considered to be so small as to be insignificant. This section therefore focuses on these transects where alone exceedances occur above the 1% threshold.

8.5.42 Table 8.3 presents nitrogen deposition levels at the closest area of qualifying habitat to each modelled road link transect (as outlined in Table 8.1).

123 APIS. Pollutant Data. Available at: http://www.apis.ac.uk/ [Date Sourced: 21/12/22]

124 Ecus. 2018. Ecological Monitoring at Ashdown Forest: Considering the Current and Future Impacts on the SAC caused by Air Quality and Nitrogen Deposition. Available at: https://www.wealden.gov.uk/UploadedFiles/Ecological_Monitoring_At_Ashdown_Forest_Report.pdf [Date Accessed: 21/12/22]

Table 8.3: Ashdown Forest SAC: Summary of key nitrogen deposition concentrations for transects at closest transect receptor point to SAC qualifying features

Transect Name	Closest qualifying habitat to roadside (m)	Nitrogen deposition from Local Plan alone (total concentration Kg N/ha/yr)	Nitrogen deposition from Local Plan in combination with other plans and projects (total concentration Kg N/ha/yr)	Change in total concentration from 2015 baseline (2035 do something minus 2015 baseline, total concentration Kg N/ha/yr)
A22 (north) - Kidbrooke Wood	150m	0.0	-0.1	-3.7
A22 (north) - Stone Quarry House	115m	0.0	-0.3	-4.2
A22 (north) - Hindleap Warren	50m	0.0	-0.2	-4.2
A22/A275 Junction	None in transect. Roadside level given.	0.2	6.7	-2.5
A22/A275 South Junction	None in transect. Roadside level given.	0.1	1.9	-6.9
A275	Roadside	0.3	8.4	2.86
A22 (south) - West Wood	50m	0.01	0.1	-2.29
A22 (south) - Milbrook Farm	Roadside	0.09	1.28	-3.79
A22 (south) Little Birch Wood	None in transect. Roadside level given.	0.2	2.3	-8.6
A26 – Poplar Farm	155m	0.0	0.3	-2.9
A26 – Owl House	150m	0.0	0.3	-2.8
A26 – Poundgate	122m	0.0	0.8	-2.5

8.5.43 As shown in Table 8.1 there is no qualifying habitat present within transects at the A22/A275 junction or the A22 at Little Birch Wood. Levels at the closest area of qualifying habitat to the A26 (Poundgate transect) are 0.0 kg/N/ha/yr. Changes in nitrogen deposition levels will not have an AIOSI at these locations from the Local Plan alone.

8.5.44 As shown in Table 8.3, nitrogen deposition levels associated with emissions from traffic on the A275 from the Local Plan alone at the closest area of heathland are 0.3 kg/N/ha/yr, falling to below zero by 50m from the road edge. This will therefore be examined further.

8.5.45 As discussed above, the Ecus study notes that a change in nitrogen deposition can correlate with a change in species richness and composition with lichens and mosses likely to be particularly effected.

8.5.46 In 2016 Capron, S. *et al.*[125] undertook a study to assess the effects of small increments of atmospheric nitrogen deposition (above the critical load) on semi-natural habitats of conservation importance. This focused on five priority habitat types[126]. This study noted that increasing nitrogen deposition correlated with decreasing species richness across all habitat types studied, and changes in vegetation composition in all habitat types with the exception of sand dunes. The study noted the importance of other external factors such as the impact of climate change and site management in species composition. The strongest relationship to nitrogen deposition was noted to be mosses and lichens. These lower plants do not have a defined root structure and are therefore more sensitive to changes in air quality. The study noted that mosses, lichens, bryophytes and forb species play an important role in maintaining favourable habitat condition at many sites and provide a good indication of habitat health. The effect on vascular plants was shown to be more modest and the response to changes in nitrogen levels more long-term.

8.5.47 The study found that even relatively small increases in long-term nitrogen deposition of 1 – 2 kg/N/ha/yr were found to have an ecological effect on species richness across all five habitat types (i.e. a reduction in species richness of 1 species) where background deposition rates were 15-20 kgN/ha/yr. The study noted that '*as nitrogen deposition increases through the critical load range, the rate of fall in species richness lessened but still existed and within the gradient of UK N deposition responses were still marked'*. The study noted that a reduction in species richness begins at the low end of the nitrogen deposition range, and by upper end of the critical load range, a substantial loss has already occurred. It concluded that at higher levels, above the critical load, the integrity of habitat had the potential to be affected by changes to the structural habitat.

[125] CAPORN, S., FIELD, C., PAYNE, R., DISE, N., BRITTN, A., EMMETT, B., JONES, L., PHOENIX, G., S POWER, S., SHEPPARD, L. & STEVENS, C. 2016. Assessing the effects of small increments of atmospheric nitrogen deposition (above the critical load) on semi-natural habitats of conservation importance. Natural England Commissioned Reports, Number 210.

[126] The habitats included: dwarf shrub heathland (upland and lowland), acid grassland, bog and sand dune (fixed-dune grassland).

8.5.48 The current AFWG SoCG notes that "*The development of dose-response relationships for various habitats clarifies the rate of additional nitrogen deposition that would result in a measurable effect on heathland vegetation, defined as the loss of at least one species from the sward. For lowland heathland it is indicated that deposition rates of c. 10-15kgN/ha/yr (representative of the current and forecast future deposition rates using background mapping) an increase of 0.8-1.3kgN/ha/yr would be required for the loss of one species from the sward*[127]*. The sites covered in the research had a range of different 'conditions' but the identified trends were nonetheless observable. The fact that a given heathland site may not have been included in the sample shouldn't be a basis for the identified trend to be dismissed as inapplicable. On the contrary, the value of the dose-response research is precisely in the fact that it covered a range of sites, subject to a mixture of different influences, meaning that consistent trends were identified across sites despite differing conditions at the sites involved. Based on the consistent responses (in terms of trend) across the range of habitats studied there is no reason why the identified trends (which have been identified as applying to bogs, lowland heathland, upland heathland, dunes and a range of other habitats) should not apply to all types of heath*".

8.5.49 Current and forecast future deposition rates for heathland habitat (taken as an average for short vegetation) is 15kg/N/ha/yr. As such it can be assumed that, based on the SoCG, with baseline deposition rates of 15kgN/ha/yr, an increase of 1.3kgN/ha/yr would be required for the loss of one species from the sward.

8.5.50 The deposition from additional traffic (Do Something 2035) is forecast to be offset by a much larger reduction in background deposition to 2035. This is expected to result in a reduction in nitrogen deposition of between 6.9-2.29kg N/ha/yr. There is one exception to this, at the A275 where the data shows there will be a small increase in nitrogen deposition levels (2.9kg N/ha/yr). The contribution from the Local Plan alone to this is 0.2kg /N/ha/y. The effect of this contribution to reduction in baseline improvements at receptors along the A275 is expected to equate to a change in species richness of 0.23 species. This is less than one species which is considered to be nugatory. As such, changes in nitrogen deposition levels are not considered likely to have an AIOSI at any location from the Local Plan alone.

[127] The cited rates are presented Table 21, page 59 of Caporn et al 2016, to illustrate the trends identified (which apply not just to species richness but, as illustrated by other tables in the same report, to other parameters). That table states that at a background rate of 10kgN/ha/yr an additional 0.3 kgN/ha/yr was associated with a reduction in species richness of '1' in lowland heathland sites. At a background rate of 15kgN/ha/yr the same effect was associated with an incremental increase of 1.3 kgN/ha/yr.

8.5.52 As shown in Table 8.3, nitrogen deposition levels associated with emissions from traffic on all road links (at the closest qualifying habitat) from the Local Plan in-combination range between 8.4 kg/N/ha/yr (on the A275) and -0.3 kg/N/ha/yr (on the A22 (north) - Stone Quarry House transect). It is noted that there is an overall reduction of levels in-combination on the northern section of the A22.

8.5.53 The current SoCG and Capron study have been taken into account to consider the nitrogen-dose response effect of this change (where in lowland heathland deposition rates of c. 10-15kgN/ha/yr, an increase of 0.8-1.3kgN/ha/yr would be required for the loss of one species from the sward). Table 8.4 applies this logic to the forecast levels of nitrogen deposition from both the Local Plan alone and in-combination. This shows that for all transects, with the exception of the A275 the change in species richness would be 1 species or less for the Local Plan in-combination.

Table 8.4: Ashdown Forest: Change in species richness

Transect Name	Closest heathland habitat to road (m)	Nitrogen deposition from Local Plan alone (total concentration Kg N/ha/yr)	Local Plan Alone - Loss of species from sward (reduction in species richness)	Nitrogen deposition from Local Plan in combination with other plans and projects (total concentration Kg N/ha/yr)	Local Plan In-combination - Loss of species from sward (reduction in species richness)
A275	Roadside	0.3	0.23	8.4	6.46
A22 (south) - West Wood	50m	0.01	0.0	0.1	0.08
A22 (south) - Milbrook Farm	Roadside	0.09	0.07	1.28	0.98
A26 – Poplar Farm	155m	0.0	0	0.3	0.23
A26 – Owl House	150m	0.0	0	0.3	0.23
A26 – Poundgate	122m	0.0	0	0.8	0.61

8.5.54 Information in the current SoCG notes that '*Within the context of a forecast net improvement in nitrogen deposition, rather than a forecast net deterioration, available dose-response data make it possible to gauge whether the air quality impact of a given plan is not just of small magnitude (which could still meaningfully contribute to an effect 'in combination') but of such a small magnitude that its contribution may exist in theory (such as in the second decimal place of the air quality model) but not in practice on the ground. Such a plan would be one where it could be said with confidence that: (a) there would not be a measurable difference in the vegetation whether or not the plan proceeded, and (b) there would not be a measurable effect on the vegetation whether or not the contribution of the plan was 'mitigated' (i.e. reduced to the extent that it did not appear in the model at all). It would clearly be unreasonable to claim that such a plan would cause adverse effect 'in combination' or that it should be mitigated*'[128].

8.5.55 When comparing the 2015 baseline nitrogen levels with the 2035 do something scenario there is an overall net improvement in nitrogen deposition. This suggests that deposition associated with additional traffic (Do Something 2035) is forecast to be offset by a much larger reduction in background deposition to 2035. The exception to this is a small deterioration on the A275 (within 5m of the road edge).

8.5.56 Given the small change in-combination in terms of species richness (less than 1) on all other road links it is considered that any reduction in net nitrogen improvements would be nugatory.

8.5.57 Data shows that there will be a small increase in nitrogen deposition levels at the A275 (8.4 kgN/ha/yr). The contribution from the Local Plan alone to this is 0.3 kg/N/ha/y. The effect of the reduction in baseline improvements at receptors along the A275 is expected to equate to a change in species richness of 6.49 species when considered in-combination (0.23 species when considered for the Local Plan alone). It is noted that this change does not mean a loss of species, but a reduction in frequency in a given survey quadrat. Within the context of a net deterioration in nitrogen deposition on the A275, it is considered prudent to consider possible mitigation measures which may be put in place to remove the Local Plan's contribution to nitrogen deposition at this location.

8.5.58 All future modelled scenarios show an overall improvement in nitrogen deposition concentrations when compared to the 2015 baseline scenario with the exception of concentrations on the A275 which show a slight decrease.

8.5.59 As set out in Section 8.3 a number of policies within the Local Plan and other local and county policies will go towards securing an improvement in local air quality through a modal shift towards sustainable transport options.

[128] AFWG. SoCG. Paragraph 2.49

8.5.60 Given the small (insignificant) contribution of the Local Plan to in-combination nitrogen deposition levels at the A275, the small impact of the Local Plan alone on species richness at the A275, background trends which show an improvement in deposition levels and when taking into consideration the policy provisions set out above to address the Local Plan's contribution to any in-combination impact, it can be concluded that there will be no in-combination AIOSI at the SAC in relation to reduced air quality caused by the Local Plan in combination. The SAC and SPA targets in respect of air quality to '*restore concentrations and deposition of air pollutants to at or below the site-relevant Critical Load or Level values given for this feature of the site on the APIS*' will not be compromised as a result of the Local Plan alone or when considered in-combination.

Acidification

8.5.61 There is one heathland critical load range for the SAC of 0.952 – 2.444 (keq/ha/yr). Current acid deposition levels shown in Table 8.5 are within the critical load range for heathland (and close to the lower range). A review of information on APIS indicates that since 2005 acid deposition at the SAC has been staying relatively stable[129].

Table 8.5: Acid deposition Critical Loads of Ashdown Forest SAC

Qualifying features	Acidity Class	Acidity Critical Loads (keq/ha/yr)	Current Acid Deposition Nitrogen | Sulphur (keq/ha/yr)
Northern Atlantic wet heaths with *Erica tetralix* (H4010)	Dwarf shrub heath	0.952 – 2.444	Maximum: 1.5 | 0.1 Minimum: 1.3 | 0.1 Average: 1.4 | 0.1
European dry heaths (H4030)	Dwarf shrub heath	0.952 – 2.444	Maximum: 1.5 | 0.1 Minimum: 1.3 | 0.1 Average: 1.4 | 0.1
Triturus cristatus - Great Crested Newt (S1166)	Freshwater	0	Maximum: 1.5 | 0.1 Minimum: 1.3 | 0.1 Average: 1.4 | 0.1

8.5.62 Table 8.5 summarises the total acid deposition concentrations for transects at the closest section of qualifying habitat. It shows the contribution to acid deposition from both the Local Plan alone and in-combination. It also illustrates the change in concentrations from the 2015 baseline scenario to a do something 2035 scenario.

[129] The APIS. Available at: http://www.apis.ac.uk/srcl/select-a-feature?site=UK0012804&SiteType=SAC&submit=Next [Date Accessed: 21/12/22].

Table 8.6: Ashdown Forest SAC: Summary of total acid deposition concentrations for transects, taken at the closest location to qualifying habitat (this is based on a review of the distribution of habitats as set out in Table 8.1[130]

Transect Name	Closest section of heathland habitat	Acid deposition from Local Plan alone (keq/ha/yr)	Acid deposition from Local Plan in combination with other plans and projects (keq/ha/yr)	Change in total concentration from 2015 baseline (2035 do something minus 2015 baseline) (keq/ha/yr)
A22/A275 Junction	None in transect. Roadside level given.	0.00	0.5	-0.2
A22/A275 South Junction	None in transect. Roadside level given.	0.00	0.1	-0.5
A275	Roadside	0.00	0.5	0.2
A22 (south) - West Wood	50m	0.00	0.0	-0.2
A22 (south) - Milbrook Farm	Roadside	0.00	0.1	-0.3
A22 (south) Little Birch Wood	None in transect. Roadside level given.	0.00	0.1	-0.7
A26 – Poplar Farm	155m	0.00	0.1	-0.2
A26 – Owl House	150m	0.00	0.1	-0.2
A26 – Poundgate	122m	0.00	0.1	-0.2

8.5.63 The modelling results show that there is an overall reduction in acid deposition when comparing all future modelled scenarios with the 2015 baseline scenario. This reflects average trend data which suggests a small reduction of acid deposition at the SAC since 2005[131]. The exception to this is a small increase on the A275 transect up to 2m from the road edge and at Owl House transect on the A26 up to 10m and on the Poundgate transect on the A26 up to 15m from the road edge.

[130] Where there is no qualifying heathland habitat present within a modelled transect – a precautionary approach has been through the use of an at roadside receptor location.

[131] APIS. Trend Data. Available at: https://www.apis.ac.uk/app [Date Sourced: 21/12/22]

8.5.64 The screening assessment applied the most conservative critical load level in order to take a precautionary approach to the assessment. As shown Appendix A2 of the AQR (Appendix D) the upper end of the critical load range (of 2.444 keq/ha/yr) is not exceeded on any transect location for any future modelled scenario. The only exception is on the A22/A275 Junction up to 2m A275 at roadside (0m), the A22 Little Birch Wood transect up to 3m from the roadside and on the A26 at the Owl House and Poundgate transects at roadside (0m).

8.5.65 A review of habitat mapping indicates that there is no qualifying heathland present within 200m of the A22/A275 Junction, A275 Junction South and the A22 Little Birch Wood transects.

8.5.66 The contribution of the Local Plan to the overall acid deposition level as shown in Table 8.5 is 0.00keq/ha/yr. This overall contribution of the Local Plan to in-combination effects is considered to be nugatory.

8.5.67 It can also be seen that when comparing the do something scenario to the 2015 baseline, there is an overall forecast improvement in acid deposition at the SAC. One increase is noted on the A275 of 0.2keq/ha/yr (road edge on the western transect and within 2m of the road on the eastern transect) but the Local Plan contribution to this is 0.0keq/ha/yr. Given this and the declining future trends in acid deposition levels at the SAC an AIOSI is therefore not considered likely.

8.6 Conclusions

8.6.1 Taking into consideration the outputs of the air quality modelling in relation to habitat types and habitat responses, baseline data, future trends and the positive impact of Local Plan policy and other initiatives to encourage sustainable and active modes of transport, it is considered that the Local Plan will have no AIOSI either alone or in-combination at Ashdown Forest SAC or SPA in terms of air quality impacts.

9 Appropriate Assessment: Mole Gap to Reigate Escarpment SAC – Air Quality

9.1 Introduction

9.1.1 The HRA screening process (Appendix F) indicated that a number of components of the Local Plan have the potential to result in LSEs at the Mole Gap to Reigate Escarpment SAC as a result of air pollution (see Table 7.1). All allocations set out in individual policies (Appendix G) also have the potential to have a cumulative and in-combination air quality effect.

9.1.2 The following Appropriate Assessment focuses on assessing more precisely the ecological impacts of air pollution at the SAC and SPA in view of their qualifying features and conservation objectives taking into account air quality information. This assessment follows Natural England's current guidance and therefore assesses the likely effects to inform a conclusion as to whether an adverse effect on site integrity can be ruled out. The following assessment also draws on CIEEM's guidance as set out in Section 8.1.

9.2 Air Quality Threats at Mole Gap to Reigate Escarpment SAC

9.2.1 Section 5.4 provides an overview of Mole Gap to Reigate Escarpment SAC and the qualifying features for which it is designated. Its conservation objectives are outlined in Appendix B.

9.2.2 Data contained in the SIP for the SAC notes that the site is vulnerable to air pollution (see Appendix B), and in particular atmospheric nitrogen deposition. It notes that the wet heathland and European dry heaths are vulnerable to air quality impacts.

9.2.3 The European dry heaths, natural box scrub, dry grasslands and scrublands on chalk or limestone, beech forest, yew dominated woodland and the Bechstein's Bat qualifying features are all vulnerable to air pollution, and in particular nitrogen deposition[132]. In addition, data contained in Natural England's Supplementary Advice identifies the potential sensitivity of the SAC to air quality impacts in terms of the deposition of airborne pollutants[133].

[132] Natural England 2019. Mole Gap to Reigate Escarpment SAC Conservation Objectives Supplementary Advice. http://publications.naturalengland.org.uk/file/6354450398838784 [Date Accessed 21/12/22].

[133] Natural England 2014. Mole Gap to Reigate Escarpment SAC Site Improvement Plan. http://publications.naturalengland.org.uk/file/6256378880458752 [Date Accessed 21/12/22].

9.3 Mitigation

9.3.1 It is anticipated that policies listed in Section 8.3 which form the Local Plan, and local initiatives intended to reliance on the private car and promote sustainable transport options, alongside the West Sussex Transport Plan will have a positive impact and contribute towards the mitigation of air quality impacts from traffic sources at the SAC. The Appropriate Assessment in respect of air quality therefore takes these into consideration.

9.4 Appropriate Assessment of Air Quality at Mole Gap to Reigate Escarpment SAC

9.4.1 As noted in Section 6.3, air quality modelling was commissioned to better define air quality impacts and is reported upon in the AQR (Appendix D)[134]. Transects included in the air quality modelling for Mole Gap to Reigate Escarpment SAC are shown in Figure 6.3. The outputs are presented by the following pollutants; nitrogen oxide, ammonia, nitrogen deposition and acid deposition.

Nitrogen Oxides

9.4.2 APIS indicates that current baseline NOx levels are below the critical level of 30μg/m^3, with a maximum concentration of 25.6μg/m^3 and an average concentration of 14.69μg/m^3 [135]. Trend data shows that NOx concentrations have fallen since 2003. This is likely to be due to improved abatement of point source emissions, such as power stations, and improved vehicle emissions technology[136]. This downward trend in data is likely to continue with improvements in vehicle emissions technology and implementation of policy such as the Clean Air Strategy (the latter which has not been taken into consideration in the modelling).

9.4.3 The air quality modeling shows that there will be a large future reduction in NOx concentrations when future modelled scenarios are compared to 2015 baseline levels at all receptors, with a halving of concentrations in most cases. This reflects the trend data.

9.4.4 The modelling shows that at all receptors in the future, NOx is below the critical level of 30μg/m^3 for both the in-isolation (alone) and in-combination scenarios.

9.4.5 Whilst the critical level is not exceeded for the Local Plan alone or in-combination, and direct toxicity will not have an LSE on the qualifying features of the SAC, it is necessary to consider the contribution of NOx to nitrogen deposition further through the Appropriate Assessment. This will allow a habitat specific assessment of potential impacts associated with emissions.

Ammonia

[134] Air Quality Consultants. April 2021. Crawley Borough Council Local Plan Air Quality Assessment.

[135] APIS. Available at: https://www.apis.ac.uk/ [Date Accessed: 22/12/22]

[136] CIEEM. January 2021. Advisory Note: Ecological Assessment of Air Quality Impacts

9.4.6 A review has been undertaken of habitat types at the transect locations included in the air quality modelling. This was based on the Priority Habitat Inventory data, SSSI management unit data, and DEFRAs interactive mapping tool (Magic) which provides spatial habitat data. The output of this review is presented in Table 9.1.

Table 9.1: Habitat types at modelled transects

Transect	Habitat Type
A217 Fox Lane	Broadleaved, mixed and yew woodland. SSSI Unit 25.
A217 Fort Lodge	Broadleaved, mixed and yew woodland. Lowland calcareous grassland area approx. 145m to the north of the A217. SSSI Unit 25.
B2032 Dawcombe Wood	Broadleaved, mixed and yew woodland – SSSI Unit 35. Lowland calcareous grassland (important orchid site) runs adjacent to the B2032 for approx. 41m. SSSI Unit 36 notes that the calcareous grassland comprises the following species: Salad Burnett dominant (10 of 10), Thyme abundant (8 of 10), Squinancywort, Dwarf thistle and common rockrose frequent (6 of 10). Birds foot trefoil and Mouse-ear Hawkweed occasional (4 of 10), Cowslip, Rough Hawkbit and Small scabious rare (2 of 10). Also present in this unit is a variety of Orchid species and Twayblades, Autumn Gentian, Carline thistle and Burnett saxifrage.
B2032 Dawcombe Cottage	As above.
A24 Longbury Wood	Broadleaved, mixed and yew woodland.
A24 Cowslip Lane	River Cliffs - deciduous woodland (SSSI Unit notes indicate that the river is still active in this location).
A24 Lodge Hill	Broadleaved, mixed and yew woodland. Lowland calcareous grassland (important orchid site).
A24 Box Hill	Broadleaved, mixed and yew woodland.

9.4.7 As shown in Table 9.1, habitat within 200m of the A217 predominantly comprises broadleaved deciduous woodland. There is also an area of calcareous grassland which is located approximately 145m from the A217 (at Fox Lane transect).

9.4.8 Habitat within 200m of the B2032 comprises a mixture of broadleaved, deciduous woodland. In addition, there is an area of calcareous grassland at the Dawcombe Cottage transect following the road edge for approximately 41m and within an area approximately 80m from the road edge.

9.4.9 Habitat within 200m of the A24 predominantly comprises broadleaved, deciduous woodland. However, there is an area of lowland calcareous grassland (noted to be an important orchid site) which is located at approximately 115m to the east of the A24 near the Lodge Hill transect and approximately 51m to the east of the B2209.

9.4.10 The B2033 was not included in the road traffic model, so it has not been possible to model the air quality impacts adjacent to this road. This was because the B2033 is not expected to result in a significant increase in traffic due to the Local Plan. Despite this, it is however possible to make a comparison with the nearby B2032 using data published by the Department for Transport (DfT).

9.4.11 Traffic flows for both roads are available on the DfT's interactive web-based map[137]. A review of this data shows that in 2019 the B2032 experienced an Annual Average Daily Traffic (AADT) flow of 14,774 vehicles, while the B2033 experienced an AADT flow of 8,436 vehicles. As the B2033 experiences much lower traffic flows than the B2032, the pollutant concentrations and deposition rates due to road traffic emissions are expected to be lower adjacent to the B2033 than they are adjacent to the B2032. The modelled impacts along the B2032 can therefore be used as a worst-case scenario for the B2033. Habitat along the B2033 is predominantly woodland with the exception of a small area around Headley Heath which comprises lowland heathland adjacent to the road for a short section.

9.4.12 Lichens and bryophytes interest in grassland is often associated with situations where grassland is under stress and competition from vascular plants is poor such as areas of disturbed ground, exposed coastal cliff tops and headlands and blown sand overlying rock or shingle[138]. Data in the SSSI Citation for Mole Gap to Reigate Escarpment SSSI notes '*areas of open turf at Burford Bridge Ridge and Juniper Top support a rich lichen flora with many noteworthy species including Toninia caeruleonigricans and Verrucaria mutabilis*'[139]. Juniper Top and Burford Ridge are not located within 200m of any of the modelled road links. There is no other mention of lichen or bryophyte communities in the citation or within the SSSI unit condition data. The site is protected as a SSSI due to the higher plants that it supports, the presence of grasses which are characteristic of chalk grassland, salad *burnet Sanguisorba minor*, yellow-wort *Blackstonia perfoliata* and field scabious *Knautia arvensis*, knapweed broomrape *Orobanche elatior*, and a wide variety of orchids among other higher level plants. As noted in Table 9.1, SSSI management unit data indicates that there are a number of higher-level plants present in the areas of calcareous grassland which are located within 200m of the road links under consideration. This would suggest that competition from higher level plants would preclude a diverse community of lichens and bryophytes in these areas. As such the higher ammonia critical level of 3μgm^{-3} is likely to be the most appropriate for application to the grassland areas in this ecological assessment.

[137] Available at: https://roadtraffic.dft.gov.uk/#6/55.254/-6.053/basemap-regions-countpoints

[138] The British Lichen Society. Lowland Grassland. Available at: https://www.britishlichensociety.org.uk/about-lichens/habitats-conservation/lowland-grassland#:~:text=Ancient%20earthworks%20and%20banks%2C%20with,grasslands%2C%20especially%20in%20calcicolous%20communities. [Date Accessed: 22/12/22].

[139] Natural England. Mole Gap to Reigate Escarpment SSSI Citation. Available at: https://designatedsites.naturalengland.org.uk/PDFsForWeb/Citation/1000977.pdf [Date Accessed: 22/12/22].

9.4.13 Similarly, for the area of heathland habitat at Headley Heath (which is located within 40m of the B2033) the SSSI citation notes that heathland is dominated by ling *Calluna vulgaris*, bell heather *Erica cinerea* and dwarf furze *Ulex minor*, often mixed with grasses such as wavy hair grass *Deschamp siaflexuosa* and common bent grass *Agrostis capillaris*. It notes that as on chalk grassland across the SAC, grazing on heathland has largely stopped, and the effect of this can be seen on Headley Heath where bracken *Pteridium aquilinum*, gorse *Ulex europaeus* and birch species *Betula pendula* and *B. pubescens* have replaced much of the open heather and acidic grassland. For the same reasons noted for Ashdown Forest SAC, the dominance of higher-level plants at Headley Heath would also suggest that the higher critical level would be the most appropriate for use in this area.

9.4.14 The modelling data indicates that the higher critical level of 3μg m^{-3} is not exceeded for the future do minimum or do something scenario at any transect (with the exception of one roadside measurement of 3.06μg m^{-3} on the A217 Fox Lane). It is noted that the SAC at the A217 is situated 7m at its closest point from the road edge. This exceedance reduces below the upper critical level at 1m from the road edge and is therefore not breached within the SAC. It is noted that there is no exceedance of the higher critical level on the B2032 which is considered to be a worst-case and precautionary representation for flows on the B2033 for which traffic modelling is not available.

9.4.15 APIS data indicates that baseline ammonia levels are below the higher level 3μg/m^3 for critical level, with an average concentration of 1.91μg/m^3 and a maximum concentration of 1.78μg/m^3. Trend data shows that ammonia concentrations have increased since 2006. APIS notes that as '*the climate warms, volatilisation of ammonia emissions will lead to a further rise in ammonia concentrations'* and that agriculture sources of ammonia are often associated with intensive dairy farming.

9.4.16 Whilst the higher critical level is not exceeded for the Local Plan in the future modelled scenarios and direct toxicity will not have an LSE on the qualifying features of the SAC, it is necessary to consider the contribution of ammonia to nitrogen deposition and acidification further through the Appropriate Assessment. This will allow a habitat specific assessment of potential impacts associated with emissions.

Nitrogen Deposition

9.4.17 As shown in Table 6.1, current levels of nitrogen deposition at Mole Gap to Reigate Escarpment SAC are within the critical load for European dry heaths and dry grasslands and scrublands on chalk or limestone that receive an average of 17.6kg N/ha/yr. However, the current levels of nitrogen deposition exceed the critical load for all other habitat types as the current average is 30.5kg N/ha/yr[140].

9.4.18 This assessment follows best practice guidance provided by CIEEM[141].

Step 1: Identifying the Baseline Ecological Features and Air Quality

[140] Air Pollution Information System APIS (2016) Site relevant critical loads, available at: http://www.apis.ac.uk/srcl [Date Accessed: 15/12/22]

[141] CIEEM. January 2021. Paragraph 20. Advisory Note: Ecological Assessment of Air Quality Impacts

9.4.19 The baseline ecological features and current air quality levels at these features are presented in Table 6.1.

Step 2: Assessing Confounding Factors, Background Pollution Trends and the Sensitivity of the Receptor

9.4.21 A review of the APIS data for the SAC indicates that nitrogen deposition to both forest and short vegetation has declined since 2005. The decline may be as a result of a number of factors including improved vehicle emissions and national uptake of cleaner technology[142]. This trend is reflected in the air quality modelling undertaken which shows an improvement from the 2015 baseline modelling when compared to the 2035 do nothing scenario. However, APIS shows a rise in deposition between 2018 and 2019.

9.4.22 APIS provides details on local contributions to nitrogen deposition from sources in the UK. This indicates that livestock is the most significant source of nitrogen deposition at 27.8%, with road transport at 12.2% (Figure 9.1).

[142] CIEEM. January 2021. Advisory Note: Ecological Assessment of Air Quality Impacts

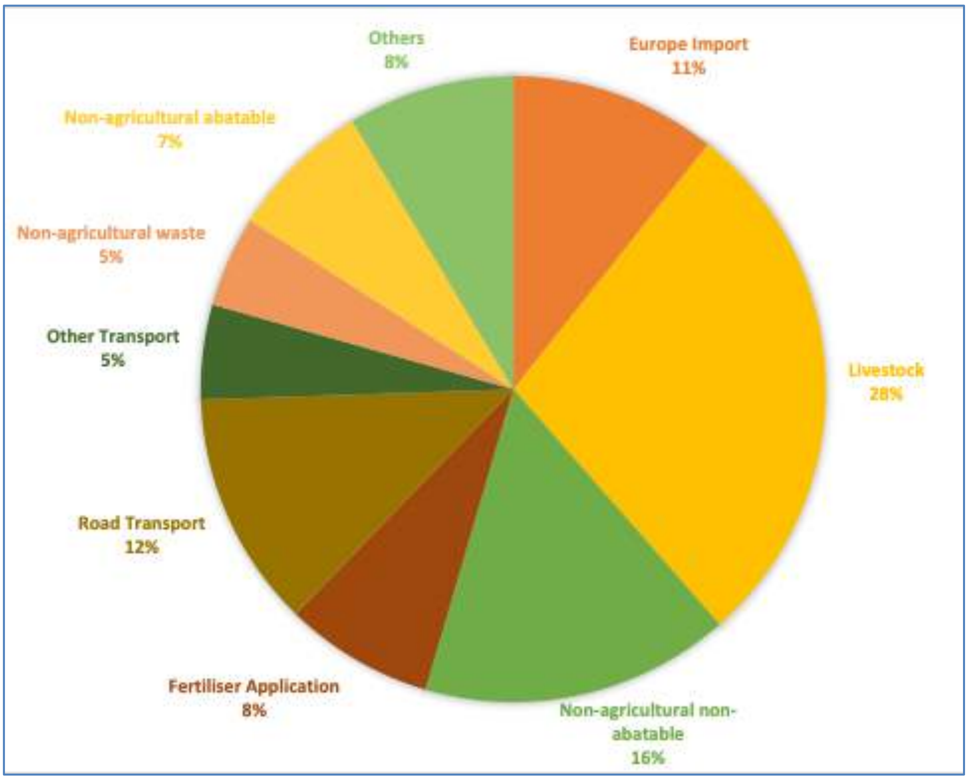

Figure 9.1: Local Contribution to Nitrogen deposition (Kg N/ha/yr) from sources (UK) at Mole Gap to Reigate Escarpment SAC[143]

9.4.23 Data in the SIP for the SAC notes that it is vulnerable to air pollution, stating that '*nitrogen deposition exceeds the site-relevant critical load for ecosystem protection and hence there is a risk of harmful effects, but the sensitive features are currently considered to be in favourable condition on the site'*. A review of SSSI management unit data indicates that of the 37 SSSI units which underpin the SAC, 23 are in a favourable conservation status (see Appendix C). Thirteen units are in an unfavourable recovering status predominantly due to storm damage, management of woodland and scrub control in woodland areas and in grassland habitat due to recreational pressures and scrub control. One unit is classed as being of an unfavourable - no change status due to inappropriate scrub control. No unfavourable status classification is attributed to poor air quality which supports the conclusion reached in the SIP.

9.4.24 The target for air quality is to maintain or restore as necessary the concentrations and deposition of air pollutants to 'at or below' the site-relevant critical load or level values given for the qualifying features of the site on APIS[144].

9.4.25 Nitrogen deposition is mapped on APIS for three 5km by 5km grid squares across the SAC. A review of baseline nitrogen deposition levels for all qualifying features indicates relatively similar levels of deposition across the SAC, with a slight increase in levels in the western section.

[143] APIS. Source Attribution Data. Available at: http://www.apis.ac.uk/srcl/source-attribution?submit=Source+Attribution&sitetype=SAC&sitecode=UK0012804&sitename=Mole+Gap+to+Reigate+Escarpment [Date Sourced: 07/05/21]

[144] Natural England 2019. Mole Gap to Reigate Escarpment SAC Conservation Objectives Supplementary Advice. http://publications.naturalengland.org.uk/file/6354450398838784 [Date Accessed 04/05/21].

Step 3: Is the Critical Load or Level Exceeded?

9.4.26 The air quality modelling indicates that there is an exceedance of critical levels for all qualifying features of the SAC for future forecast scenarios at varying distances from the roadside. For woodland and heathland, exceedances of the minimum critical load (10kg N/ha/yr) are forecast at all receptors and for all future scenarios modelled. For grassland the minimum critical load (15kg N/ha/yr) is forecast to be exceeded at all receptors and transects, with the exception of a number of receptors on the B2032.

9.4.27 When taking the closest point of the SAC to the modelled road links for each transect (worst case deposition levels) the modelling shows that there is a maximum baseline level for 2015 of between 37.12kg N/ha/yr (for forest vegetation) and 16.2kg N/ha/yr (for short vegetation (deposition is modelled for both short and forest vegetation depending on habitat type present)). With increasing distance from the road source these levels decrease to between 24.04kg N/ha/yr (forest vegetation) and 14.09kg N/ha/yr (short vegetation) at 200m from the modelled road links.

9.4.28 A detailed analysis of critical levels at each road link is provided below in the context of habitat specific data.

A217

9.4.29 Habitat along the A217 (Fox Lane and Fort Lodge transects) is dominated by broadleaved deciduous woodland with the exception of a small component of calcareous grassland located approximately 145m to the north of the A217. The lowest critical load ranges for woodland (10kg N/ha/yr) and grassland (15kg N/ha/yr) are exceeded at all receptor locations within these transects for all scenarios.

9.4.30 With the exception of receptors within 7m of the road edge which are not located within the SAC designation, the results show that nitrogen deposition reduces for the 2035 do minimum and do something scenarios when compared to the 2015 baseline.

B2032 (and B2033)

9.4.31 Habitat along the B2032 comprises broadleaved woodland and calcareous grassland. Habitat along the B2033 comprises predominantly woodland with the exception of a small area around Headley Heath which comprises lowland heathland adjacent to the road for a short section. The lowest critical load range for woodland and dry heath (10kg N/ha/yr) is exceeded at all receptor locations within the two transects at this link (Dawcombe Wood and Dawcombe Cottage) for all scenarios. The lowest critical load range for grassland (15kg N/ha/yr) is exceeded at up to 1m from the road edge for the 2035 do minimum and do something scenarios only.

9.4.32 Nitrogen deposition reduces for the 2035 do minimum and do something scenarios when compared to the 2015 baseline at both transects at all receptor locations.

A24

9.4.33 Habitat along the A24 comprises broadleaved woodland with a component of calcareous grassland to the east of the A24 at Lodge Hill. The lowest critical load ranges for woodland (10kg N/ha/yr) and grassland (15kg N/ha/yr) are exceeded at all receptor locations within these transects for all scenarios.

9.4.34 Nitrogen deposition reduces for the 2035 do minimum and do something scenarios when compared to the 2015 baseline at all transects and locations.

Summary

9.4.35 The 2035 do nothing scenario is a hypothetical scenario which assumes no traffic growth between 2015 and 2035 but allows for improvements in vehicle technologies and therefore a corresponding improvement in emissions. The modelling data indicates that there will be an overall reduction in nitrogen deposition levels when comparing the 2015 baseline condition to the modelled 2035 do nothing scenario. This is the case for all transects and receptors with the exception of a number within 7m of the A217 (at the Fox Lane and Fort Lane transects).

Step 4: Apply Critical Loads and Critical Levels with Expert Judgement

9.4.36 Exceedances of critical loads for nitrogen deposition may modify the chemical status of the substrate, accelerating or damaging plant growth, altering its vegetation structure and composition and causing the loss of sensitive typical species associated with it.

9.4.37 Nitrogen deposition within a woodland can lead to increased sensitivity of trees to natural stress, impacts on roots, reduced species diversity of the ground vegetation, reduced growth, and an unbalanced nutritional status due to eutrophication and acidification.

9.4.38 As noted for Ashdown Forest SAC (above), heathland is also particularly sensitive to changes in nitrogen deposition as it is often poor in nutrients. Effects can include changes in species composition, dominance of grasses, reduction in lichen, changes to plant biochemistry and increases in sensitivity of species to stress.

9.4.39 Grasslands have a lower sensitivity to nitrogen deposition, however those where there is limited nutrient availability are more vulnerable to increased nitrogen deposition. This can result in a change in species composition favouring some plants over others[145].

Consideration of Local Plan impacts alone

9.4.40 The level of nitrogen deposition from the Local Plan alone at all links, with the exception of the A217, is below the 1% threshold and is therefore considered to be so small as to be insignificant. This section therefore focuses on the A217 where exceedances of the 1% threshold occur.

9.4.41 Table 9.2 presents nitrogen deposition levels at the closest point of the SAC to each modelled road link transect. This provides a worst case and precautionary approach as concentrations are greatest at the road edge, decreasing with distance from the road source.

[145] APIS. Pollutant Data. Available at: http://www.apis.ac.uk/ [Date Sourced: 22/12/22]

Table 9.2: Mole Gap to Reigate Escarpment SAC: Summary of key nitrogen deposition concentrations for transects at closest transect receptor point to designation

Transect Name	Distance from road (m)	Habitat Type (Table 9)	Nitrogen deposition from Local Plan alone (total concentration Kg N/ha/yr)	Nitrogen deposition from Local Plan in combination with other plans and projects (total concentration Kg N/ha/yr)	Change in total concentration from 2015 baseline (2035 do something minus 2015 baseline, total concentration Kg N/ha/yr)
A217 Fort Lodge	7	Woodland	0.44	5.69	0.14
A217 Fox Lane	0	Woodland	0.69	8.92	3.00
B2032 Dawcombe Wood	0	Grass	0.03	1.51	-0.61
B2032 Dawcombe Cottage	0	Grass	0.03	1.41	-0.64
A24 Longbury Wood	78	Woodland	0	0.32	-3.17
A24 Cowslip Lane	60	Woodland	0	0.28	-3.15
A24 Lodge Hill	80	Woodland	0	0.31	-3.43
A24 Box Hill	12	Woodland	0.01	1.47	-3.02

9.4.42 As shown in Table 9.2, nitrogen deposition levels associated with emissions from traffic on the A217 from the Local Plan alone at roadside are between 0.44kg /N/ha/yr and 0.69kg /N/ha/yr at the closest point to the SAC. Habitat along the A217 predominantly comprises broadleaved deciduous woodland.

9.4.43 There is also an area of lowland calcareous grassland located approximately 145m to the north of the A217 within SSSI management unit 25 (see Table 9.1). Concentrations of nitrogen deposition from the Local Plan alone are below the 1% threshold from 30m from the road edge. It is therefore considered that nitrogen deposition at this area of grassland (145m from the road) from the Local Plan alone is not significant (less than 1% of the critical load). This assessment therefore focuses on broadleaved deciduous woodland habitat.

9.4.44 The Capron study explored the effects of small increments of atmospheric nitrogen deposition (above the critical load) on a range of semi-natural habitats[146]. In terms of woodlands the Capron study noted that the impact of nitrogen deposition on vegetation composition is poorly understood partly due to the strong influence that tree canopy structure places on ground flora through interception of light, rainfall and pollution and the effect of woodland management and nitrogen deposition upon this structure. It was found that the interaction with the effect of canopy shading can dampen the response of lower plants to nitrogen. The lack of an overall relationship between species richness and nitrogen deposition makes it difficult to assume a dose-response relationship to broad-scale nitrogen deposition in woodlands over a national gradient. However, the study noted that it is likely that the edges of woodlands will be more strongly affected by nearby pollutant sources[147]. As stated, the Capron study found that even relatively small increases in long-term nitrogen deposition of 1 – 2kg N/ha/yr were found to have an impact on species richness across all five UK priority habitats. The contribution of the Local Plan alone within 30m of the A217 is significantly below this level (a worst-case roadside level of 0.44kg N/ha/yr and 0.69kg N/ha/yr).

9.4.45 Given the small area over which predicted nitrogen levels will increase on the A217 for the Local Plan alone (up to 30m from the road side), the magnitude of the modelled increase (significantly less than 1 – 2 kg/N/ha/yr), the uncertainty in woodland response to nitrogen deposition it is considered that there will be no AIOSI from the Local Plan alone in terms of nitrogen deposition at the A217.

Consideration of Local Plan in-combination

9.4.46 Table 9.2 shows there is an improvement in nitrogen deposition at the SAC when comparing all future 2035 scenarios against the 2015 baseline scenario at all road links with the exception of the A217. On the A217 there is a small increase (between 0.14 and 3.00kg N/ha/yr).

9.4.47 Whilst overall there is a reduction in the overall level of nitrogen in the future scenarios when compared to the 2015 baseline scenario, it is possible that the forecast increased in nitrogen deposition may have an adverse effect on site integrity through a reduction in improvements, if this were considered to be ecologically significant.

9.4.48 As shown in Table 9.3, nitrogen deposition levels associated with emissions from traffic on the A217 from the Local Plan in-combination range between 8.92kg N/ha/yr (on the A217 Fox Lane transect) and 0.28kg N/ha/yr (on the A24 Cowslip Lane transect) at the closest point to the SAC designation. The higher levels of 8.92 and 5.69kg N/ha/yr are associated with the A217, whilst the range of levels on all other transects is much lower at between 0.28 and 1.51kg N/ha/yr.

[146] CAPORN, S., FIELD, C., PAYNE, R., DISE, N., BRITTN, A., EMMETT, B., JONES, L., PHOENIX, G., S POWER, S., SHEPPARD, L. & STEVENS, C. 2016. Assessing the effects of small increments of atmospheric nitrogen deposition (above the critical load) on semi-natural habitats of conservation importance. Natural England Commissioned Reports, Number 210.

[147] Kirby, K.J., Smart, S.M., Black, H.I.J., Bunce, R.G.H.,Corney,P.M.and Smithers,R.J. (2005). Long term ecological change in British woodland (1971-2001). Peterborough: English Nature (Research Report 653)

9.4.49 Habitat along all road links comprises broadleaved deciduous woodland and calcareous grassland. There is also a small area around Headley Heath which comprises lowland heathland. The response of woodlands and heathland to increased nitrogen deposition is discussed above for Ashdown Forest. In terms of calcareous grassland, the Capron study notes that calcareous grassland is less sensitive to nitrogen deposition than other less well buffered pH systems stating that '*calcareous habitats are less affected by nitrogen deposition than less well pH buffered systems'*. It goes on to note that '*Even in the less sensitive calcareous habitat, the temporal change study in calcareous grasslands found the greatest decline in individual species was in the areas receiving 25-35 kg N ha-1 y-1*' (page 45). This study would suggest that the lower range of this critical load range (15kg N/ha/yr) may be slightly conservative and the upper range may be more representative of habitat response to nitrogen deposition at the SAC (25kg N/ha/yr).

9.4.50 Given the lack of research into nitrogen dose-response for calcareous grassland and woodland habitat it is difficult to determine the effect of nitrogen deposition on these habitat types. This is particularly compounded by the unknown effects of factors such as canopy cover as discussed above.

9.4.51 The Capron study however provides an idea of dose-response relationships for other habitat types including heathland, acid grassland and sand dune habitats. Appendix 5 of this study provides a summary of relationships between nitrogen deposition and species richness by habitat type expressed as a percentage of the maximum in a habitat. This shows a variety of responses to differing nitrogen deposition levels.

9.4.52 The air quality modelling indicates that background 2035 nitrogen deposition levels are forecast to be on average 13kg N/ha/yr across all short vegetation receptors and 20kg N/ha/yr across all forest vegetation receptors. Taking the higher baseline deposition rate, the Capron work (Appendix 5 of the study) shows the effect of increased nitrogen doses on species richness across all habitats studied for a range of nitrogen doses of between 0.3kg and 5kg N/ha/yr. These loadings equate to a change in species richness of between 0.5% and 8% of the total species richness (77). This equates to a change of species richness of 0.61 species for every change of 0.5kg, 1.23 species for a change of 1kg and 6.16 species for a change of 5kg. It is noted that this change does not mean a loss of species just a reduction in frequency in a given survey quadrat.

9.4.53 For lowland heathland habitat specifically, these loadings equate to a smaller change in species richness of between 1.0% and 8.7% of the total species richness (37). This equates to a change of species richness of 0.37 species for every change of 0.5kg, 0.8 species for a change of 1kg and 3.2 species for a change of 5kg.

9.4.54 Looking at the change in nitrogen deposition levels of the Local Plan in-combination, it can be seen that there will be a maximum change of 0.61 species (significantly less in some instances) for all links with the exception of the A217 where there will be a change of approximately 6.16 species. This is less for heathland habitat.

9.4.55 Given the small change in-combination in terms of species richness (less than 0.61) on all road links (other than the A217) it is considered that any reduction in net nitrogen improvements would be nugatory.

9.4.56 Data shows that on the A217 there will be an in-combination increase in nitrogen deposition levels (maximum 8.92kg N/ha/yr). The contribution from the Local Plan alone to this is a maximum of 0.69kg N/ha/y. The effect of the reduction in baseline improvements at receptors along the A217 is expected to equate to a change in species richness of 6.16 species when considered in-combination (less than one species when considered for the Local Plan alone). Within the context of a net deterioration in nitrogen deposition on the A217, it is considered prudent to consider possible mitigation measures which may be put in place to remove the Local Plan's contribution to nitrogen deposition at this location.

Mitigation Measures

9.4.57 A number of the policies within the Local Plan aim to mitigate the impact of traffic related air pollution by promoting sustainable transport options. In addition, there are a number of local initiatives aiming to achieve a similar modal shift. These are set out in Section 8.3.

9.4.58 Acting together, the Local Plan policies, local and wider county initiatives will promote sustainable transport options with reductions in reliance on the private car and associated reductions in traffic emissions. It is noted that these policies and initiatives have not been included in the air quality modelling and have some potential to reduce the need for journeys to work by private vehicle thereby further reducing the already small contribution of the Local Plan to traffic related emissions at the SAC.

Conclusions

9.4.59 It can be concluded that there is no AIOSI from the Local Plan alone as a result of nitrogen deposition.

9.4.60 All future modelled scenarios show an overall improvement in nitrogen deposition concentrations when compared to the 2015 baseline scenario with the exception of concentrations on the A217 which show a slight decrease.

9.4.61 As set out above a number of policies within the Local Plan and other local and county initiatives will go towards securing an improvement in local air quality through a modal shift towards sustainable transport options.

9.4.62 Given the small contribution of the Local Plan to in-combination nitrogen deposition levels at the A217, the small impact of the Local Plan alone on species richness at the A217, background trends which show an improvement in deposition levels and when taking into consideration the policy provisions set out above to address the Local Plan's contribution to any in-combination impact, it can be concluded that there will be no in-combination AIOSI at the SAC in relation to reduced air quality caused by the Local Plan. The SAC target in respect of air quality to '*maintain or restore as necessary the concentrations and deposition of air pollutants to at or below the site-relevant Critical Load or Level values given for this feature of the site on the APIS*' will not be compromised by the Local Plan either alone or in-combination.

Acidification

9.4.63 As noted above, current background levels of acid deposition are within or below the relevant critical load ranges for each qualifying feature when taking the average level of deposition into consideration. The modelling results show that beyond 2m from the road edge there is an overall reduction in acid deposition when comparing all future modelled scenarios with the 2015 baseline scenario. This reflects trend data which suggests a reduction of acid deposition at the SAC since 2005[148].

9.4.64 The screening assessment applied the most conservative critical load level in order to take a precautionary approach. As shown in Table 9.1 habitat in the SAC along the A217 predominantly comprises woodland with some small areas of lowland calcareous grassland area which are located approximately 145m to the north of the A217.

9.4.65 The lowest critical load range for woodland is 1.623 keq/ha/yr and for grassland is 4.856 keq/ha/yr). The upper grassland level is not exceeded for any receptor on the A217 for the Local Plan in any modelled scenario.

9.4.66 The lower woodland range of 1.623 keq/ha/yr is exceeded for a number of receptors up to 30m from the edge of the road for the future modelled scenarios. The maximum Local Plan alone contribution is 0.05 keq/ha/yr and the maximum in-combination contribution is 0.64 keq/ha/yr.

9.4.67 The level of the alone contribution is considered to be nugatory. The difference in acid deposition levels from the Local Plan scenario alone, allowing for all traffic growth to 2035, is considered to be nugatory for the A217. Taking this into consideration alongside future trends relating to acid deposition levels at the SAC, an AIOSI is therefore not considered likely. Acid deposition is therefore not discussed further in this document.

9.5 Conclusions

9.5.1 Taking into consideration the outputs of the air quality modelling in relation to habitat types and response, baseline data, future trends and the positive impact of local plan policy it is considered that the Local Plan will have no AIOSI either alone or in-combination at the Mole Gap to Reigate Escarpment SAC in terms of air quality impacts.

[148] APIS. Trend data. Available at: http://www.apis.ac.uk/srcl/select-a-feature?site=UK0012804&SiteType=SAC&submit=Next [Date Sourced: 22/12/22]

10 Appropriate Assessment: Mole Gap to Reigate Escarpment SAC - Water

10.1 Introduction

10.1.1 The HRA screening process (Appendix F and Appendix G) indicates that allocations proposed in the Local Plan are located within the Thames River Basin District Area and within the River Mole management catchment. The River Mole, a tributary of the River Thames, flows along the western boundary of the Plan area with a number of smaller watercourses throughout the Plan area, such as Gatwick Stream and Crawter's Brook, feeding into the River Mole, which passes downstream through the Mole Gap to Reigate Escarpment SAC designations. The Local Plan therefore has the potential to have water effects at this designation.

10.2 Water Quality Threats at Mole Gap to Reigate Escarpment SAC

10.2.1 Section 5.4 provides an overview of Mole Gap to Reigate Escarpment SAC and the qualifying features for which it is designated. Its conservation objectives are outlined in Appendix B.

10.2.2 Water quality and quantity have been identified as a threat to the 'Dry heaths' and 'Great Crested Newts' qualifying features of Mole Gap to Reigate Escarpment SAC. Of particular concern is the condition of the network of ponds that support the local newt population. Poor water quality or inadequate quantities of water can adversely affect the structure and function of ponds, and ultimately their suitability for Great Crested Newts.

10.2.3 Natural England's Mole Valley to Reigate Escarpment Supplementary Advice presents attributes which are ecological characteristics of the designated species and habitats within this site[149]. The following Qualifying Features of this site are noted to be vulnerable to hydrological changes.

- European Dry Heath; and
- Great Crested Newt.

10.2.4 Data set out in the SIP notes that for European Dry Heath habitat "*the lowland heath habitat at Headley Heath exhibits a degree of variation related to soil wetness. Areas of the site with impeded drainage have a distinctive composition with increased frequency of purple moor-grass Molinia caerulea, common bent Agrostis capillaris and rush Juncus species. This natural variation provides additional habitat diversity which will increase the suitability of the habitat for reptiles, wetland invertebrates and birds*". It states that surface water wetness is likely to be related to rainfall rather than groundwater flow and that this may only require on-site safeguards to protect water supply and water quality.

[149] Natural England. 2019. European Site Conservation Objectives: Supplementary advice on conserving and restoring site features. Mole Gap to Reigate Escarpment Special Area of Conservation (SAC). Available at: http://publications.naturalengland.org.uk/file/6354450398838784 [Date Accessed: 22/12/22].

10.2.5 In terms of Great Crested Newt data in the SIP states that "*great crested newt populations are critically dependent on the quality and quantity of water supply to their supporting wetland habitats. Poor water quality and inadequate quantities of water can adversely affect the structure and function of ponds and their suitability for great crested newt*". It states that the ponds at Headley Heath are fed by rainfall and surface water flow[150].

10.3 Mitigation

10.3.1 It is anticipated that the following policies, which form the Local Plan will have a positive impact and contribute towards the mitigation of water impacts at the SAC. The Appropriate Assessment in respect of water therefore takes these into consideration.

- SDC3 – Tackling Water Stress. This policy requires development to be planned to a high standard of water efficiency to help address serious water stress. Where development is located outside the Sussex North Water Resource Zone, the following requirements apply:
    - New residential development will be designed to utilise no more than 110 litres of main supplied water per person per day, as per Buildings Regulations optional requirement for tighter water efficiency;
    - New non-domestic buildings will be designed to meet the minimum standards for BREEAM 'Excellent' within the Water category.
- EP1: Development and Flood Risk. This policy requires development to demonstrate that peak surface water run-off rates and annual volumes of run-off will be reduced through the effective implementation, use and maintenance of SuDS.
- EP3: Land and Water Quality. This policy requires development to adhere to the appropriate local and national standards, procedures and principles to ensure protection of water quality.
- GI1: Green Infrastructure. This policy requires incorporation of Sustainable Urban Drainage Systems (SuDS) into new development. These will have a positive impact upon water quality.
- IN1: Infrastructure Provision. This policy requires infrastructure provision to be in place for new development which includes waste water treatment.

10.3.2 The Environment Agency as the environmental regulator, among other roles, has responsibility for water quality and resources in England. It manages discharges to the water environment through the issue of Environmental Permits (EPs). These control the release of sewage discharges from Wastewater Treatment Works (WwTW). Issue of these EPs considers flow conditions and provides consent for maximum pollutant concentrations for each discharge. The objective of this system is to ensure that the receiving watercourse is not prevented from meeting its environmental objectives, with specific regard to the physico-chemical status element of the WFD classification.

[150] Natural England. 2014. Site Improvement Plan. Mole Gap to Reigate Escarpment SAC. http://publications.naturalengland.org.uk/file/6256378880458752 [Date Accessed: 14/12/22].

10.3.3 Acting together, the Local Plan policies and the Environment Agency's permitting system will help to ensure the protection of water quality and quantity. These policies will be applied in the appropriate assessment of water quality impacts at the SAC.

10.4 Appropriate Assessment of Water Impacts at Mole Gap to Reigate Escarpment SAC

Water Quality

10.4.1 Discharges of pollution can come from point and diffuse sources associated with new development. Increased domestic and / or employment discharge can lead to increased discharges at WwTWs (point source pollution). Diffuse sources of pollution can include contaminated runoff from new roads, drainage from residential areas and accidental spillages (for instance during construction of development or from commercial and employment sites).

10.4.2 The Plan area lies within the Thames River Basin Management Plan (RBMP)[151] area. The WFD provides an indication of the health of the water environment and whether a water body is at good status or potential. This is determined through an assessment of a range of elements relating to the biology and chemical quality of surface waters and quantitative and chemical quality of groundwater. To achieve good ecological status or potential, good chemical status or good groundwater status every single element assessed must be at good status or better. If one element is below its threshold for good status, then the whole water body's status is classed below good. Surface water bodies can be classed as high, good, moderate, poor or bad status.

10.4.3 The WFD sets out areas which require special protection. These include areas designated for "*the protection of habitats or species where the maintenance or improvement of the status of water is an important factor in their protection including relevant Natura 2000 sites designated under Directive 92/43/EEC (the Habitats Directive) and Directive 79/409/EEC (the Birds Directive)*"[152].

10.4.4 The Thames RBMP provides a framework for protecting and enhancing the benefits provided by the water environment. To achieve this, and because water and land resources are closely linked, it also informs decisions on land-use planning. It provides strategic level policy guidance in relation to baseline classification of water bodies, statutory objectives for protected areas and water bodies and a summary of measures to achieve statutory protection.

10.4.5 The RBMP sets out a number of ongoing measures that help prevent deterioration and protect the many uses of the water environment. These include:

- Physical modifications;
- Managing pollution from wastewater;
- Managing pollution from towns, cities and transport;

[151] Defra and Environment Agency. December 2015. Thames River Basin District – River Basin Management Plan.

[152] Official Journal of the European Communities (2000) Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy. Available at: https://eur-lex.europa.eu/resource.html?uri=cellar:5c835afb-2ec6-4577-bdf8-756d3d694eeb.0004.02/DOC_1&format=PDF [Date Accessed: 28/01/20]

- Changes to natural flow and levels of water;
- Managing invasive non-native species; and
- Manage pollution from rural areas.

10.4.6 An HRA was prepared alongside the development of the Thames RBMP[153]. Data in the HRA identified potential hazards associated with implementation of measures set out within in the RBMP. These hazards were noted to be associated with the types of measures that are related to each significant water management issue. The level of detail of the RBMP did not allow detailed consideration of effects on individual Habitats sites. However, at the strategic level of the RBMP, the assessment undertaken allowed confidence that the measures could go ahead without harm to Habitats sites, subject to more detailed scrutiny of mitigation options at the lower tier plan or project level through adoption of project level HRA. It therefore concluded that, at the strategic plan level, when taking into consideration the range of potential mitigation options available, the RBMP is not likely to have any significant effects on any Habitats sites, alone or in combination with other plans or projects.

10.4.7 The Council commissioned a number of studies related to the issue of serious water stress and water supply, including a Water Cycle Study (WCS)[154,155]. Water quality modelling was undertaken as part of the WCS using SIMCAT models provided by the Environment Agency. This modelling focused on the discharge of effluent from Wastewater Treatment Works (WwTW) as a result of development and growth in the area in which they serve to identify potential negative impacts on the quality of the receiving watercourse. Under the WFD, a watercourse is not allowed to deteriorate from its current WFD classification (either as an overall watercourse or for individual elements assessed).

10.4.8 The phosphate concentration in the River Mole at the downstream extent of the Horley to Hersham reach was used to estimate the deterioration in water quality at the SAC. The model predicted there would be no deterioration in the River Mole in this reach from growth within the Gatwick Sub-region. Deterioration in water quality was predicted to be less than 10% and would not result in a change in WFD class. It noted that improvements in treatment processes at WwTWs upstream would allow an improvement in water quality should it be required to offset growth.

[153] Environment Agency. 2015. River basin management plan for the Thames River Basin District Habitats Regulations Assessment Updated December 2015

[154] JBA. August 2020. Gatwick Sub-Region Water Cycle Study. Final Report August 2020. Available at: https://crawley.gov.uk/planning/planning-applications/you-apply/water-neutrality-crawley [Date Sourced: 22/12/22]

[155] JBA. January 2021. Crawley Borough Council Addendum to the Water Cycle Study. Final Report January 2021. Available at: https://crawley.gov.uk/planning/planning-applications/you-apply/water-neutrality-crawley [Date Sourced: 22/12/22]

10.4.9 Discharges from employment and commercial premises and WwTWs will require an EP to be issued from the Environment Agency. EPs control these sources of pollution. In addition, Local Plan policy will ensure appropriate sewerage treatment capacity is in place to protect water quality to WFD standards (IN1: Infrastructure Provision). Runoff from roads, roofs and areas of hard standing may not require an EP. These sources of runoff can be managed through implementation of SuDS as required through Local Plan policy (EP1: Development and Flood Risk).

10.4.10 Taking into consideration the modelling results, regulatory framework and policy requirements, it can be concluded that there will be no AIOSI at the Mole Gap to Reigate Escarpment SAC due to a change in water quality or quantity as a result of the Local Plan either alone or in combination.

Water Quantity

10.4.11 It is a statutory requirement that every five years water companies produce and publish a Water Resources Management Plan (WRMP). The WRMP demonstrates long term plans to accommodate the impacts of population growth, drought, environmental obligations and climate change uncertainty in order to balance supply and demand.

10.4.12 Three water companies supply water in the Gatwick Sub-Region and include.

- SES Water serves Reigate and Banstead and the northern portion of Crawley, notably including Gatwick Airport.
- Southern Water serves Horsham and the majority of Crawley.
- South East Water serves Mid Sussex and the south eastern edge of Crawley.

10.4.13 Water companies divide their supply into Water Resource Zones (WRZs). Crawley north lies within the SES Water East Surrey WRZ, with Crawley lying with the Southern Water Sussex North WRZ and South East Crawley within the South East Water Haywards Heath WRZ. All three WRZs in the study area are classed as being under serious water stress with a number of deficits identified over the plan period.

10.4.14 The WCS undertook a review of the relevant WRMPs alongside estimates of future housing growth in the local area to determine whether resources are projected to be in surplus or deficit at any point over the period of the Local Plan.

- SES Water – Revised Draft Water Resources Management Plan 2019[156];
- Southern Water – Water Resource Management Plan 2020[157]; and
- South East Water – Water Resources Management Plan 2020 to 2080[158].

[156] SES Water. April 2019. Revised Draft Water Resources Management Plan 2019 – Main Report.

[157] Southern Water. Water Resource Management Plan 2020: Technical Overview

[158] South East Water. Water Resources Management Plan 2020 to 2080

10.4.15 CAMS are six-year water abstraction licensing strategies developed by the EA for managing water resources at the local level, produced for every river catchment area in England and Wales. The process comprises three stages, including resource assessment and management (RAM), interpreting the results of RAM to achieve sustainable abstraction and an abstraction licencing (AL) strategy. The CAMS process aims to assess the amount of water available for further abstraction licensing, taking into account environment needs and implement the RBMPs and Water abstraction plan[159] into licencing policy.

10.4.16 Crawley is located with the River Mole CAMS area. Information in the WCS notes that groundwater abstraction accounts for 72% all licenced abstractions in this catchment, with the majority of these coming from a chalk aquifer. The WCS outputs note that consumptive groundwater licences which do not have a direct impact upon main river flows may be permitted but may be subject to restrictions such as prescribed groundwater levels. Restrictions will be determined on a case-by-case basis, dependent upon the nature and scale of any abstraction.

10.4.17 Abstraction licences, issued through the CAMS process, outline the site-specific flow standards developed for Habitats sites and measures to prevent unsustainable abstraction. Changes to abstraction and discharge regimes as a result of new development would not be permitted unless the applicant can demonstrate compliance with the Habitats Regulations.

10.4.18 It is considered that water supply issues to the Thames River Basin District Area and the River Mole management catchment will be addressed through the higher-level water planning framework (WRMP and CAMS). Taking this into consideration alongside water efficacy requirements set out in the Local Plan (Policy SDC3 – Tackling Water Stress), it can be concluded there will be no AIOSI at the Mole Gap to Reigate Escarpment SAC as a result of the changes in water supply due to the Local Plan alone or in-combination.

10.5 Conclusion

10.5.1 Taking into consideration the outputs of the water quality modelling, higher tier protective plans and licencing and the positive impact of the Local Plan policy it is considered that the Local Plan will have no AIOSI either alone or in-combination at the Mole Gap to Reigate Escarpment SAC in terms of water impacts.

[159] DEFRA. July 2021. Policy Paper: Water Abstraction Plan. Available at: https://www.gov.uk/government/publications/water-abstraction-plan-2017/water-abstraction-plan [Date Accessed: 22/12/22]

11 Appropriate Assessment: Arun Valley SAC, SPA and Ramsar – Water

11.1 Introduction

11.1.1 The HRA screening process (Appendix F and Appendix G) indicates that a number of components of the Local Plan have the potential to result in LSEs upon the Arun Valley SAC, Arun Valley SPA and Arun Valley Ramsar sites as a result of changes to water quality and quantity.

11.2 Water Quality Threats at the Arun Valley SAC, SPA and Ramsar designations

11.2.1 The Arun Valley is located in the South Downs in West Sussex. It consists of low-lying grazing marsh, predominantly on alluvial soils, but with an area of peat derived from a relict raised bog. Local differences in soil conditions and water supply have resulted in a range of ecological conditions and a diverse flora and fauna across the site. The southern components of the Arun Valley are fed by calcareous springs, with the northern components, where the underlying geology is Greensand, being fed by more acidic water[160]. Sections 5.6-5.8 provide an overview of the Arun Valley designations and the qualifying features for which each site is designated. Details on the qualifying features of the Arun Valley SAC and Arun Valley SPA and the qualifying criteria of the Arun Valley Ramsar site are provided at Appendix B.

11.2.2 As noted in Section 10.4, Crawley north lies within the SES Water East Surrey WRZ, with Crawley lying with the Southern Water Sussex North WRZ and South East Crawley within the South East Water Haywards Heath WRZ. All three WRZs in the study area are classed as being under serious water stress with a number of deficits identified over the plan period.

11.2.3 Natural England provided a position statement in September 2021 to LPAs regarding potential applications within the Sussex North WRZ. This was followed up with an advice note regarding water neutrality in February 2022[161]. These note that the Sussex North WRZ supplies from a groundwater abstraction point (at Pulborough) which cannot, with certainty, conclude no adverse effect on site integrity at the Arun Valley SAC, Arun Valley SPA and Arun Valley Ramsar site. Natural England note that the impact of groundwater abstraction within the Sussex North Water Supply Zone has been of concern since 2019. In particular, Natural England believes that the ongoing abstraction is having a detrimental impact on a number of designated sites including Amberley Wild Brooks SSSI and Pulborough Brooks SSSI. These form part of Arun Valley SPA, Arun Valley SAC and Arun Valley Ramsar site.

[160] Natural England. 2019. European Site Conservation Objectives: Supplementary advice on conserving and restoring site features. Arun Valley SAC Available at: http://publications.naturalengland.org.uk/file/6257846618685440 [Date Accessed: 04/11/20].

[161] https://crawley.gov.uk/planning/planning-applications/you-apply/water-neutrality-crawley

11.2.4 Surveys undertaken as part of the 'Back from the Brink' project at Pulborough Brooks SSSI (part of the Arun Valley SAC) in 2013/14 found the little whirlpool ramshorn snail population was expanding in the north of the reserve but was absent from the southern and central sections. A further survey of Amberley Brooks SSSI in 2015/16 found it was only present in 1 ditch[162].

11.2.5 Natural England are currently undertaking a full integrated condition assessment of the SSSI sites that make up the Arun Valley SAC, SPA and Ramsar designations. Results currently suggest (on the basis of water levels) that the sites' condition is Unfavourable. Monitoring is ongoing in relation to water quality and Natural England has indicated that the final report is expected soon. Natural England indicate in their advice that they are awaiting the findings of this report before drawing any definitive conclusions regarding the Habitats Sites. However, conclude at this stage existing abstraction cannot be ruled out as contributing to or causing an ongoing adverse impact on the sites.

11.2.6 As it cannot be concluded that the existing abstraction within the Sussex North Water Supply Zone is not having an impact on these designated sites, Natural England has advised that developments within this zone must not add to this impact. Case law indicates that, where there are known adverse effect upon a Habitats site, a plan or project must demonstrate with certainty that it will not contribute further to these effects. This is set out in Case C-323/17 People over wind and Sweetman. Ruling of CJEU (often referred to as sweetman II) and Coöperative Mobilisation for the Environment and Vereniging Leefmilieu Case C-293/17 (often referred to as the Dutch Nitrogen cases) [163].

11.2.7 Developments within the Sussex North WRZ set out in the Local Plan must therefore not add to this impact. Natural England indicate that one way of achieving this is to demonstrate water neutrality. Water neutrality is defined in the WCS as *'For every new development, total water use in the region after the development must be equal to or less than the total water-use in the region before the new development.'*

11.2.8 Natural England note that 'new development' is considered to be any relevant project requiring a public water supply from Southern Water's Sussex North Water Supply Zone (as illustrated in Figure 11.1).

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[162] Surveys undertaken by the Conchological Society. https://naturebftb.co.uk/2019/05/10/little-whirlpool-ramshorn-snail-project-at-pulborough-brook/

[163] Ruling of CJEU Coöperative Mobilisation case; Joined cases C-293/17 and C-294/17 (often referred to as the Dutch Nitrogen cases). C-293/17 and C-294/17 Judgment of the Court (Second Chamber) of 7 November 2018 in Coöperatie Mobilisation for the Environment UA and Vereniging Leefmilieu v College van gedeputeerde staten van Limburg and College van gedeputeerde staten van Gelderland. Requests for a preliminary ruling from the Raad van State. http://curia.europa.eu/juris/liste.jsf?language=en&num=C-293/17

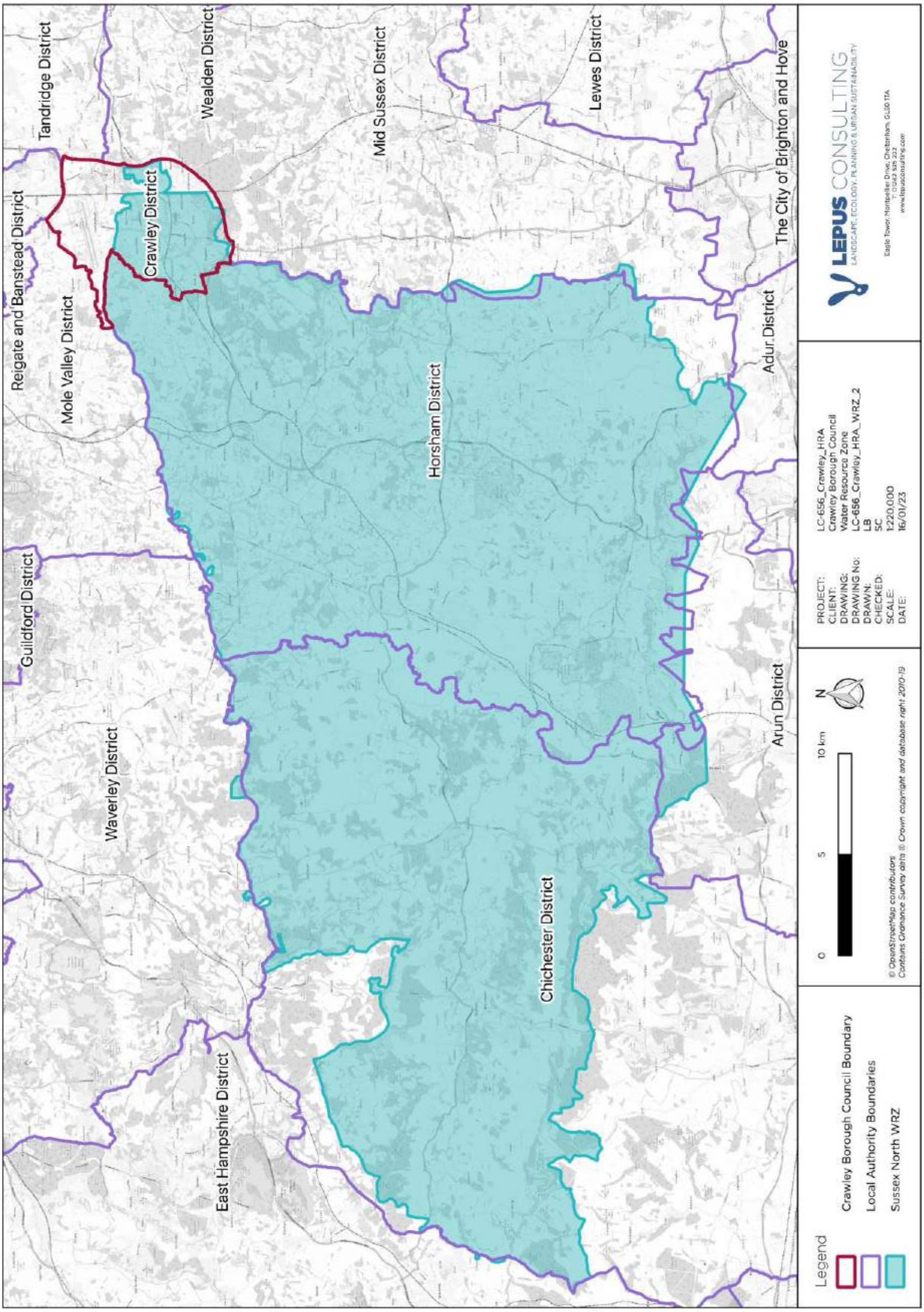

Figure 11.1: Sussex North Water Supply Zone

11.3 Mitigation

11.3.1 Investigations and discussions between Southern Water, the Environment Agency and Natural England on the long-term sustainability of the Pulborough abstraction are ongoing. These include a sustainability investigation to assess what level of ground and surface water abstractions are sustainable.

11.3.2 In the interim period the Council has been working with neighbouring affected LPAs to identify a water neutrality approach to mitigation to address this issue and allow adoption of their Local Plan. This work has been undertaken in three stages[164]:

- Part A[165]: Individual local authority areas assessments. This study calculates the individual impact of each local authority on water resources using estimates of future growth. The contribution that could be theoretically possible from different offsetting measures is also presented.
- Part B[166]: In-combination assessment. This study combines the individual authority assessments into a Water Resource Zone-wide assessment using the same methodology for assessment as Part A.
- Part C[167]: Water neutrality assessment. This report outlines a strategy to achieve water neutrality within the Sussex North Water Resource Zone, throughout the timeframe covered by the Local Plans of Crawley Borough Council, Chichester District Council, Horsham District Council, and South Downs National Park Authority (SDNPA).

11.3.3 The objective of the water neutrality strategy (Part C) is to demonstrate compliance with the Habitats Regulations and enable Local Plans to proceed towards adoption. The strategy was endorsed by Natural England in a letter provided on 23 November 2022[168].

11.3.4 The strategy includes the following elements:

- The current growth forecasts of the commissioning LPAs that must be made water neutral;
- Recommended targets for water efficiency in new builds;
- The contribution that Southern Water are making through their water demand reduction activities as part of their WRMP;
- The remaining water demand to be offset;
- Recommended methods to achieve this offset; and
- An outline of how an offsetting scheme may be managed.

11.3.5 To achieve water neutrality the water demand must first be reduced as far as possible before the remaining demand is offset in the WRZ.

[164] https://crawley.gov.uk/planning/planning-applications/you-apply/water-neutrality-crawley

[165] JBA. July 2021. Water Neutrality Study: Part A – Individual Local Authority Areas.

[166] JBA. April 2022. Water Neutrality Study – Part B – In-combination.

[167] JBA. December 2022. Sussex North Water Neutrality Study: Part C – Mitigation Strategy.

[168] https://crawley.gov.uk/planning/planning-applications/you-apply/water-neutrality-crawley

11.3.6 The strategy achieves demand reduction through ambitious water efficiency standards which will be secured through Local Plan Policy SDC3 – Tackling Water Stress (Section 10.3) and Policy SDC4: Water Neutrality (Box 1). New residential development within the WRZ must achieve a water efficiency target of 85 litres per person per day and new non-domestic development must achieve a score of three credits within the water (Wat 01 Water Consumption) issue category for the BREEAM New Construction Standard.

11.3.7 Part of the current Southern Water WRMP (WRMP19) is a strategy to reduce water demand on the network through a reduction in household per capita consumption and a reduction in leakage. This will effectively offset part, but not all, of the growth proposed within Local Plan (alone and in-combination)

11.3.8 To deliver the Water Neutrality Strategy, there will also be an LPA-led Scheme to provide water offsetting. Priority of access to offsetting delivered through the LPA-led Offsetting Scheme will be given to sites allocated in Local Plans and/or identified in the associated, published Local Plan housing trajectories (for example an allowance for Windfall). Strategic-scale windfall development (which falls outside the Local Plans' Strategic Approach) will not be prioritised.

11.3.9 The offsetting scheme has demonstrated its ability to achieve water neutrality through outputs of a trial study in Crawley. It will ensure water neutrality for all development which will come forward through the Local Plan and will be secured through Policy SDC4: Water Neutrality (Box 1).

Box 1: Local Plan Policy SDC4: Water Neutrality
1. All development within the Sussex North Water Resource Zone (WRZ) will need to demonstrate water neutrality through water efficient design and offsetting of any net additional water use of the development. This is to be achieved by ensuring that: Water Efficient Design a) New residential development is designed to utilise no more than 85 litres of mains supplied water per person per day; b) New non-domestic buildings to achieve a score of 3 credits within the water (WAT01 Water Consumption) issue category for the BREEAM Standard or an equivalent standard set out in any future update; AND Offsetting Water Use c)Development proposals must demonstrate that having achieved water efficient design, any remaining mains-supplied water use from the development is offset such that there is no net increase in mains-supplied water use within the WRZ compared with pre-development levels. <u>Offsetting Schemes</u> 2. A local planning authority-led water offsetting scheme will be introduced to bring forward development supported by Local and Neighbourhood Plans. The authorities will manage access to the offsetting scheme to ensure that sufficient water capacity exists to accommodate planned growth within the Plan period. 3. Development proposals are not required to utilise the local planning authority-led offsetting scheme and may bring forward their own offsetting schemes. Offsetting schemes can be located within any part of the WRZ, with the exception that offsetting will not be accepted within the Bramber/Upper Beeding area in Horsham District. Identified in the Policies Map, unless the application site is located within the Bramber/Upper Beeding area. <u>Alternative Water Supply</u> 4. Where an alternative water supply is to be provided, the statement will need to demonstrate that no water is utilised from sources that supply the Sussex North WRZ. The acceptability of alternative water supplies will be considered on a case-by-case basis. <u>Water Neutrality Statement</u> 5. A water neutrality statement will be required to demonstrate how policy requirements have been met in relation to water supply, water efficient design and offsetting. The statement shall provide, as a minimum, the following: a. baseline information relating to existing water use within a development site; b. full calculations relating to expected water use within a proposed development; and c. full details of how any remaining water use will be offset.

11.3.10 Once a long-term solution has been put in place by Southern Water, a water neutrality scheme may no longer be required. For this reason, it is proposed in the Part C work that the Offsetting Scheme outlined in this Strategy runs to 2030, when it is reviewed. An extension to the Offsetting Scheme to cover a further period may then be required.

11.3.11 A LPA-led Offsetting Scheme will require an operating body that will administer it, collect funding, pay offset providers and monitor results. This body will need to work closely with Southern Water to monitor their progress in reducing overall per capita consumption in the WRZ, which will be a critical component in the Strategy. It will also be important to monitor the difference between actual water demand from new development and its designed water demand. These details will be worked up and put in place prior to adoption of the Local Plan.

11.3.12 This detailed mitigation package will be considered in the following appropriate assessment of water impacts.

11.4 Appropriate Assessment of Water Impacts at the Arun Valley SAC, SPA and Ramsar

Water Quality

11.4.1 The water quality modelling undertaken as part of the WCS[169] (see Section 10.4) indicates that no WwTW serving the Crawley area will discharge to the Arun catchment. As such it can be concluded there will be no AIOSI from water quality on the Arun Valley SAC, SPA or Ramsar as a result of discharges from the Plan area.

Water Quantity

11.4.2 As illustrated in Figure 11.1, parts of Crawley lie within Sussex North WRZ. Development set out in the Local Plan has the potential to increase abstractions from this water supply zone and add to the existing adverse impacts upon the integrity of the Arun Valley SAC, SPA and Ramsar.

11.4.3 The qualifying feature of the SAC is the little whirlpool ram's-horn snail (*Anisus vorticulus*) (Appendix B). It relies on unpolluted calcareous water in marsh drains with a dense aquatic flora. It is particularly associated with ditches with a diverse flora but little emergent vegetation. The Arun Valley SAC designated area provides one of the three main population centres for this species of snail in the UK, the others being the Norfolk Broads and the Pevensey Levels.

11.4.4 The Arun Valley SPA is designated for the non-breeding population of Bewick's swan and assemblage of waterfowl (including: Shoveler *Anas clypeata*, Teal *Anas crecca*, Wigeon *Anas penelope*, Bewick's Swan *Cygnus columbianus bewickii.*) that the site supports (Appendix B).

11.4.5 Broad habitat types within the SPA designation which support these species of birds include the following:

- *Cynosurus cristatus-Centaurea nigra* lowland meadows;
- Inland wet grassland;
- *Glyceria maxima* (Reed Sweet-grass) swamp;
- *Glyceria fluitans* (floating-sweet grass) water-margin vegetation; and
- Network of ditch systems.

11.4.6 The Arun Valley Ramsar is designated for a number of British Red Data Book species of invertebrates and plant species that it supports. In addition, it is also designated due to its winter waterfowl population and winter populations of Northern Pintail (*Anas acuta*) (Appendix B).

[169] Natural England. 2014. Site Improvement Plan. Arun Valley SPA and SCI. Available at: http://publications.naturalengland.org.uk/file/5185212862431232. Sourced: 08/09/20.

11.4.7 As set out in Section 11.3, mitigation required through Local Plan policy for water efficiency measures and the LPA-led water neutrality off-setting scheme will ensure development in the Local Plan will achieve water neutrality. Exact details regarding the delivery mechanism for this project will be further defined in due course and prior to Local Plan adoption. The water neutrality scheme which is secured through planning policy will ensure no AIOSI take place at the Arun Valley SAC, SPA and Ramsar site as a result of the Local Plan either alone or in-combination.

11.5 Conclusion

11.5.1 Taking into consideration the outputs of the water quality modelling and water neutrality strategy secured in the Local Plan, it is considered that the Local Plan will have no AIOSI either alone or in-combination at the Arun Valley SAC, SPA or Ramsar in terms of water impacts.

12 Appropriate Assessment: The Mens SAC – Habitat loss and fragmentation

12.1 Introduction

12.1.1 The HRA screening process (Appendix F and Appendix G) indicates that a number of components of the Local Plan have the potential to result in indirect LSEs upon the Mens SAC as a result of changes to water quality and quantity effects at the Arun Valley SAC, SPA and Ramsar which are used.

12.2 Habitat loss and fragmentation threats at the Mens SAC

12.2.1 The Barbastelle Bat is a qualifying feature of the Mens SAC (see Appendix B). As noted in Section 5.9, a body of research shows that Barbastelle Bats forage up to 7km from their roost sites. This means that there is an ecological habitat linkage specific to Barbastelle Bats across land that lies to the east of The Mens SAC, principally on the floodplain of the River Arun[170,171,172].

12.2.2 Potential adverse impacts upon water quality and water quantity in the Arun Valley (as discussed in Section 11) have the potential to result in a change to or loss of foraging habitat outside the SAC designation boundary. Poor water quality or inadequate quantities of water can adversely affect the structure and function of such wetland habitats and therefore the extent of foraging areas for the Barbastelle Bat. This may have an indirect impact upon this qualifying feature and the conservation objectives of the SAC by limiting the range and / or quality of foraging habitat.

12.3 Mitigation

12.3.1 Mitigation outlined in Section 11.3 will ensure the protection of water quantity within the Arun Valley from development set out in the Local Plan. This detailed mitigation package will be considered in the following appropriate assessment.

[170] Greenaway, F. 2008. Barbastelle bats in the Sussex West Weald 1997 – 2008.

[171] Greenaway, F. 200. Advice for the management of flightlines and foraging habitats of the barbastelle bat Barbastellus barbastellus. English Nature Research Report, Number 657.

[172] https://www.bats.org.uk/our-work/landscapes-for-bats/core-sustenance-zones

12.4 Appropriate Assessment of habitat loss and fragmentation impacts at the Mens SAC

12.4.1 As noted in Section 11, the water quality modelling undertaken as part of the WCS173 (see Section 10.4) indicates that no WwTW serving the Crawley area will discharge to the Arun catchment. As such it can be concluded there will be no adverse effects from a change in water quality on foraging habitat used by the Barbastelle Bat and therefore no AIOSI at the Mens SAC from the Local Plan alone or in-combination.

12.4.2 As set out in Section 11.3, mitigation required through Local Plan policy for water efficiency measures and the LPA-led water neutrality off-setting scheme will ensure development in the Local Plan will achieve water neutrality. This will ensure no adverse effects on water levels at the Arun Valley from the Local Plan either alone or in-combination. As such it can be concluded there will be no adverse effects from a change in water levels on foraging habitat used by the Barbastelle Bat and therefore no AIOSI at the Mens SAC from the Local Plan alone or in-combination.

12.5 Conclusion

12.5.1 Taking into consideration the outputs of the water quality modelling and water neutrality strategy secured in the Local Plan, it is considered that the Local Plan will have no adverse effects on water quality or levels in the Arun Valley and therefore no AIOSI on the Mens SAC either alone or in-combination.

[173] Natural England. 2014. Site Improvement Plan. Arun Valley SPA and SCI. Available at: http://publications.naturalengland.org.uk/file/5185212862431232. Sourced: 08/09/20.

13 Conclusions and Next Steps

13.1 Conclusions

13.1.1 The Local Plan is not directly connected with or necessary to the management of any Habitats site. A screening assessment was therefore undertaken which identified a number of LSEs associated with the Local Plan. Taking no account of mitigation measures these had the potential to affect the following Habitats sites:

- Ashdown Forest SAC and SPA – air quality LSEs in-combination;
- Mole Gap to Reigate Escarpment SAC – air quality LSEs in combination;
- Mole Gap to Reigate Escarpment SAC – hydrology LSEs alone;
- Arun Valley SAC – hydrology LSEs alone;
- Arun Valley SPA – hydrology LSEs alone;
- Arun Valley Ramsar – hydrology LSEs alone; and
- The Mens SAC – habitat loss and fragmentation (at functionally linked land due to knock on hydrological LSEs) LSEs alone.

13.1.2 The HRA therefore progressed to an Appropriate Assessment which looked at the impacts of a change in air quality, water quality and quantity and impacts upon functionally linked land upon the qualifying features and conservation objectives of each Habitats site.

13.1.3 The Appropriate Assessment has taken into consideration the outputs of detailed air quality modelling and water quality modelling to inform the conclusions of the Appropriate Assessment. Planning policy has also been informed by a large piece of work that was commissioned by the Council and other affected LPAs within the Sussex North WRZ to ensure all Local Plans (both alone and in-combination) would achieve nutrient neutrality. Required mitigation is secured through policies within the Local Plan itself and through the wider protective environmental protection framework.

13.1.4 On the basis of the Appropriate Assessment, the HRA concluded that the Local Plan would have no AIOSI at any Habitats site, either alone or in-combination.

13.2 Next steps

13.2.1 The purpose of this report is to inform the HRA of the Submission Publication Consultation version of the Local Plan using best available information.

13.2.2 The Council, as the Competent Authority, have responsibility to make the Integrity Test, which can be undertaken in light of the conclusions set out in this report.

13.2.3 This report will be submitted to Natural England, the statutory nature conservation body, for formal consultation. The Councils must 'have regard' to their representations under the provisions of Regulations 63(3) and 105(2) prior to making a final decision as to whether they will 'adopt' the conclusions set out within this report as their own.

Appendix A: In-Combination Assessment

Plans and Policies	Plan Status	Proposed development – Key elements of the Plan that could cause in-combination effects	Summary of HRA findings	Potential in-combination Likely Significant Effect (LSE)
Reigate and Banstead Borough Council	The Reigate & Banstead, Development Plan consists of the following: • Core Strategy (adopted 2014 and reviewed 2019) • Development Management Plan (adopted 2019) • Policies Map	The Core Strategy includes provision of at least 460 dwellings per annum between 2012 and 2027. On 2 July 2019, the Council completed a review of all the 2014 Core Strategy policies, which concluded that the Core Strategy remains up to date, and that none of its policies currently need modifying or updating. The Development Management Plan (DMP) was adopted in September 2019. The DMP includes specific site allocations to deliver the level of growth and the spatial strategy set out in the Core Strategy. The Objectively Assessed Need is 9,000-9,600 over the plan period (2012-27), however the Housing	An HRA was undertaken alongside the development of both the Core Strategy and DMP. The HRA of the DMP screened in impacts in relation to traffic generated air quality in combination effects on Mole Gap and Reigate Escarpment SAC; Wimbledon Common SAC and Thames Basin Heaths SPA. Recreational and hydrology impacts were screened out following a review of recreational data and existing recreational resources, current management regimes and review of hydrological pathways. Air quality modelling was commissioned to support the HRA process. This concluded that there would be a net decrease in nitrogen deposition to SAC habitats along the modelled links, notwithstanding the precautionary assumptions made in the modelling concerning improvements in NO2 emission factors. Accordingly, growth to 2033 would not have a significant in- combination adverse effect on the integrity of the SAC by way of contributing to any net increase in nitrogen deposition. The AA analysed SSSI IRZ data which highlighted possible areas of Bechstein's Bat (*Myotis bechsteinii*) foraging habitat in the area surrounding the Mole Gap to Reigate Escarpment SAC as they were within the functional linkage for the protected species and therefore formed part of the core sustenance zone (CSZ)[1].	Yes. This plan has the potential to trigger LSEs in terms of air quality, water and recreational in-combination effects with the Local Plan.

[1] Reigate and Banstead Borough Council. Development Management Plan: Main Modifications. HRA AA Addendum. March 2019.

Plans and Policies	Plan Status	Proposed development – Key elements of the Plan that could cause in-combination effects	Summary of HRA findings	Potential in-combination Likely Significant Effect (LSE)
		Requirement in the adopted and reviewed Core Strategy is 6,900 due to constraints. Employment Borough total of approximately 46,000 sqm is set out in the DMP.		
Mid Sussex District Council	Mid Sussex District Council adopted the Mid Sussex District Plan 2014-2031 28th March 2018.	The Local Plan aims to deliver 25 ha of employment land The District's Objectively Assessed Need (OAN) is 14,892 dwellings over the Plan period. Provision is also made of 1,498 dwellings to ensure unmet need is addressed in the Northern West Sussex Housing Market Area. There is a minimum District housing requirement of 16,390 dwellings between 2014 – 2031.	HRA was undertaken during the development of the Mid Sussex District Plan. The HRA of the Main Modifications version of the Plan focused on LSEs on Ashdown Forest SAC (in terms of air quality) and Ashdown Forest SPA (in terms of recreation impacts). The HRA included an assessment of traffic modelling (Mid Sussex Transport Study[2] which provides an in-combination assessment incorporating growth assumptions for surrounding local authority areas) and air quality modelling data. Predicted traffic flow changes as a result of development proposed by the District Plan, in combination with growth assumptions for surrounding local authority areas, ranged from an increase of 267 AADT on the A275 to decreases of -27, -197 and - 263 on the A22, A26 and B2110 respectively. Changes in nutrient nitrogen loads are predicted to range between 0.05kg N/ha/yr (0.5% of the minimum critical load) within dry heath habitat c.5m from the A275, and -0.01kg N/ha/yr (-0.1% of the minimum critical load) within wet heath habitat c.100m from the A26. The HRA concluded that these changes are unlikely to significantly alter the extent and distribution of qualifying natural habitats and are unlikely to affect the integrity of the Ashdown Forest SAC. The HRA considered recreational zones of influence (7km). The continued commitment of Mid Sussex to delivery of strategic level	Yes. This plan has the potential to trigger LSEs in terms of air quality and water in-combination effects with the Local Plan.

[2] Amey (2017): Updated Mid Sussex Transport Study: Modelling Output (May 2017).

Plans and Policies	Plan Status	Proposed development – Key elements of the Plan that could cause in-combination effects	Summary of HRA findings	Potential in-combination Likely Significant Effect (LSE)
			SANG and an interim SAMMS strategy to mitigate recreational impacts at Ashdown Forest SPA were considered. The HRA concluded that the Main Modifications to the District Plan will not result in adverse effects on the ecological integrity of the Ashdown Forest SPA. The District Plan was considered compliant with the Habitats Regulations in respect of both sites.	
Horsham District Council	Horsham District Council are in the process of updating their local plan and undertook consultation on their Regulation 18 Draft Local Plan between 17 February and 30 March 2020.	The standard methodology calculation for Horsham District is calculated as 965 dwellings per annum. This is equivalent to providing a minimum of 17,370 homes in the period between 2019 and 2036. The Local Plan may also look to accommodate unmet housing need in neighbouring authority areas.	The Regulation 18 version of the Local Plan was accompanied by an HRA screening report[3]. This screened in the following European sites for further assessment in the HRA process: • Arun Valley Special Protection Area; • Arun Valley Special Area of Conservation; • Ebernoe Common Special Area of Conservation; • The Mens Special Area of Conservation; and • Ashdown Forest Special Area of Conservation. The HRA will focus on recreation, air quality, noise and hydrology impacts. The HRA will be undertaken alongside development of the Local Plan.	Yes. This plan has the potential to trigger LSEs in terms of air quality and water in-combination effects with the Local Plan.
Tandridge District Council	Tandridge District Council are in the process of preparing their local plan. The Local Plan will replace the Council's currently adopted Core	The Regulation 22 Submission Version of the Local Plan sets out provisions for 6,056	The HRA submitted in support of the submission version of the Local Plan[4] provided an appropriate assessment of LSEs on the following European sites: Ashdown Forest SPA and SAC	Yes. This plan has the potential to trigger LSEs in terms of air quality, recreation

[3] Place Services. 2019. Horsham Local Plan. Habitats Regulations Assessment Screening Report.

[4] Tandridge District Council. Habitats Regulation Assessment for the Tandridge District Council Local Plan 2033 and Garden Community Appropriate Assessment Report. January 2019. Local Plan Submission.

Plans and Policies	Plan Status	Proposed development – Key elements of the Plan that could cause in-combination effects	Summary of HRA findings	Potential in-combination Likely Significant Effect (LSE)
	Strategy (2008). The examination hearings were undertaken in November 2019. The inspector's preliminary conclusions and advice have been received. This identifies a number of soundness issues associated with the Plan. Following a Planning Policy Committee on 23 June 2022, it was resolved that the OTH2E- Local Development Scheme 2022 is adopted and supersedes the January 2020 version of the document.	homes within the Plan period to 2033. The Plan also provides for the delivery of at least 15.3ha of B-class employment space.	- Recreational Disturbance - Air Quality Mole Gap to Reigate Escarpment SAC - Recreational Disturbance - Hydrology - Air Quality On the basis of a review of recreational survey data, availability of existing and proposed recreational resource and established zones of influence recreational no adverse impacts on site integrity were concluded. Hydrological links were investigated, and strong SUDS policies included within the Local Plan. Detailed air quality modelling was undertaken. A review of air quality data, trends and strong transport policies in the plan resulted in a conclusion of no adverse effect on site integrity. The HRA concluded no adverse effects on the integrity of any European site alone or in-combination.	and water in-combination effects with the Local Plan.
Mole Valley District Council	Mole Valley District Council are currently in the process of reviewing their local plan. On Monday 14th February 2022 the Mole Valley Local Plan 2020-37 was submitted to the Secretary of State for Levelling up, Housing and Communities for independent examination.	The Regulation 18 version of the Plan sets out a housing requirement for Mole Valley to deliver at least 6,000 additional homes within the 2020-2037 plan period (353 homes each year).	An HRA was prepared in support of the Local Plan[5]. The HRA focused on atmospheric impacts, water quality, recreational pressure and functionally linked land at Mole Gap to Reigate Escarpment and recreational pressure at the Thames Basin Heaths SPA. Air quality modelling was undertaken which demonstrated no adverse impacts on any Habitats sites. AECOM recommended a strengthening of transport policies and commitment to district wide initiatives to reinforce this conclusion and monitoring. A recommendation was made regarding strengthening of policy wording to ensure protection of bat functionally linked habitat.	Yes. This plan has the potential to trigger LSEs in terms of air quality, recreation and water in-combination effects with the Local Plan.

[5] AECOM. 2021. Habitat Regulations Assessment of the Mole Valley Draft Local Plan.

Plans and Policies	Plan Status	Proposed development – Key elements of the Plan that could cause in-combination effects	Summary of HRA findings	Potential in-combination Likely Significant Effect (LSE)
			Policy wording was also suggested to ensure provision of SANG to mitigate recreational impacts. On the basis of these amendments, it was concluded that the Local Plan would have no adverse effect on the integrity of any European site.	
Brighton and Hove City Council	The City Plan Part One was adopted in March 2016. City Plan Part Two was adopted on 20th October 2022.	The City Plan Part One makes provision for at least 13,200 new homes to be built over the plan period 2010 – 2030 (this equates to an annual average rate of provision of 660 dwellings).	An HRA was undertaken in support of the City Plan Part One[6]. This focused on the following impacts: - Increased recreational pressure on green spaces and the countryside including the possibility of increased visits to the European sites. - Increased traffic, leading to increased air pollution, which could affect species that are sensitive to air quality. - Increased resource use, including minerals, water and fuel. Increased water abstraction could affect water levels at the European sites. It focused on impacts at the following European sites: - Arun Valley SAC; - Ashdown Forest SPA and SAC; - Lewes Downs SAC; and - Castle Hill SAC. The HRA concluded no adverse effect on any European site alone or in-combination.	Possible air quality in-combination LSEs.
Lewes District Council	Lewes Core Strategy Local Plan Part 1 was adopted in May 2016.	The Core Strategy now plans for at least 6,900	HRA was undertaken alongside development of the Core Strategy – Local Plan Part 1. The HRA accompanying the submission version of the Core Strategy[7] focused on the following protected sites:	Possible air quality and recreation in-combination LSEs.

[6] Brighton & Hove City Council. May 2012. Local Development Framework Draft Brighton & Hove City Plan Part 1. Appropriate Assessment.

[7] Lewes District Council & The South Downs National Park Authority. 2013. Lewes District Core Strategy: Proposed Submission Stage (Regulation 20) Habitat Regulations Assessment Report (Stages 1 – 3).

Plans and Policies	Plan Status	Proposed development – Key elements of the Plan that could cause in-combination effects	Summary of HRA findings	Potential in-combination Likely Significant Effect (LSE)
	The Local Plan Part 2 allocates land for housing, including Gypsy and traveller pitches, and employment. It also sets out detailed planning policies to guide development and change in the period to 2030. The Local Plan Part 2 was adopted in February 2020 On 2 September 2021 the consultation on the Issues and Options document was closed and a summary report published in May 2022.	new dwellings between 2015 and 2030. In the period between 2012 and 2031, in the region of 74,000 square metres of employment floorspace (B1, B2 and B8) will be provided in the plan area. Local Plan Part 2 applies only to the area of the district outside the South Downs National Park (National Park) and the housing requirement reflects this. Of the overall total, a residual figure of 1,660 net additional dwellings forms the basis for the housing allocations identified within the Local Plan Part 2 and neighbourhood plans.	- Lewes Downs - Special Area of Conservation (SAC) - Castle Hill - SAC - Ashdown Forest - SAC and Special Protection Area (SPA) - Pevensey Levels - Ramsar site and Candidate SAC. Following the adoption of mitigation measures (specifically to address impacts at Ashdown Forest SPA/SAC) this report concluded that the Core Strategy would not have significant effect on any European site. In 2015 an HRA addendum[8] was prepared in support of the Core Strategy. This focused on air quality impacts on the Lewes Downs SAC specifically and concluded that based on the vehicle flow data provided by East Sussex County Council it can be concluded that the contribution of Local Plan traffic to changes in NOx concentration and nitrogen deposition rate within 200m of the Lewes Downs SAC would be sufficiently small that a conclusion of no likely significant effect on the SAC alone or in combination can be drawn. Following the Wealden Judgement, in 2017 AECOM undertook an air quality impact assessment for Lewes District Council and South Downs National Park Authority, which modelled forecast traffic growth on key roads within 200m of Ashdown Forest SAC over the period 2017 to 2033, including that expected due to the quantum and distribution of growth in the adopted Lewes Joint Core Strategy (as it relates to Lewes District outside the South Downs National Park) and the South Downs Local Plan[9]. Tunbridge Wells Borough Council commissioned AECOM to use the same traffic and air quality models to undertake an identical analysis for the emerging Tunbridge Wells Local Plan. Sevenoaks District Council also commissioned an analysis. Based on the outputs of the air quality modelling and a review of dose-response	

[8] Lewes District Council. 2015. Habitat Regulations Assessment Addendum July 2015. Air Quality impacts of the Core Strategy Main Modifications. On the Lewes Downs SAC.

[9] AECOM. 2017. South Downs National Park Authority Local Plan/Lewes Joint Core Strategy Habitats Regulations Assessment Addendum. Traffic-Related Effects on Ashdown Forest SAC.

Plans and Policies	Plan Status	Proposed development – Key elements of the Plan that could cause in-combination effects	Summary of HRA findings	Potential in-combination Likely Significant Effect (LSE)
			relationships, this work concluded that air quality impacts would not be significant in-combination. An HRA was undertaken of Lewes District Council's Local Plan Part 2 (LPP2) and Neighbourhood Plans, which allocate specific sites suitable for development in order to meet the Joint Core Strategy requirements for quantum of housing and employment to the end of the Plan period (2030)[10]. This had a particular focus on recreational impacts at Ashdown Forest SAC/SPA. It concluded that there will be no adverse effects on the integrity of any European sites due to growth in Local Plan Part 2, either alone or in combination with other plans and projects.	
Eastbourne Borough Council	Eastbourne are currently undertaking a Local Plan review. Consultation has been undertaken on the first stage: Issues and Options. The Council is currently undertaking a public consultation on the 'Growth Strategy', which will end on the 20th of January 2023.	The Issues and Options document consults on a number of options for housing delivery in Eastbourne. The Growth Plan makes provision for 6,401 new homes (an average of 320 homes per year) and 53,000 sqm of employment floorspace.	This document was accompanied by an HRA screening report[11]. It concluded that the following European sites and impact pathways will be taken forward to the Appropriate Assessment stage of HRA when developing the policies of the new Eastbourne Local Plan 2018-2038: • Ashdown Forest SAC – air quality impact pathway; • Pevensey Levels SAC – water quality impact pathway; and • Lewes Downs SAC – air quality impact pathway.	Possible air quality in-combination LSEs.
Rother District Council	The Core Strategy was adopted in 2014. The Core Strategy does not allocate specific sites for	The Core Strategy aims to plan for at least 5,700 dwellings (net) in the district over the period	In 2018 AECOM undertook the Habitat Regulations Assessment (HRA) of the Rother Development and Site Allocations Plan (DaSA)[12]. This assessment focused on the following European sites:	Possible air quality in-combination LSEs.

[10] AECOM. 2018. Lewes Local Plan Part 2 & Neighbourhood Plans. Habitats Regulation Assessment.

[11] Eastbourne Borough Council. Eastbourne Borough Council Local Plan. Habitat Regulations Assessment. Screening Report October 2019

[12] AECOM. 2018. Habitat Regulations Assessment: Rother District Council Likely Significant Effects and Appropriate Assessment

Plans and Policies	Plan Status	Proposed development – Key elements of the Plan that could cause in-combination effects	Summary of HRA findings	Potential in-combination Likely Significant Effect (LSE)
	development. Development policies and site allocation policies have been adopted in a separate document called the Development and Site Allocations (DaSA) Local Plan which was adopted in 2019. The Council is in the process of reviewing its Local plan and will issue a new Local Development Scheme to reflect an updated timeframe for the delivery of the Rother Local Plan alongside the Regulation 18 consultation.	2011-2028 and for at least 100,000 square metres of gross additional business floorspace.	- Pevensey Levels SAC; - Pevensey Levels Ramsar site; - Dungeness, Romney Marsh and Rye Bay SPA (including the marine SPA extension); - Dungeness, Romney Marsh and Rye Bay Ramsar; - Dungeness SAC; - Hastings Cliffs SAC; - Ashdown Forest SAC; - Ashdown Forest SPA; and - Lewes Downs SAC. The HRA concluded that an adequate mitigation strategy for both the proposed development sites and development policies will be in place to ensure that there will be no adverse effects on the integrity of the Pevensey Levels SAC/Ramsar and Dungeness Romney Marsh and Rye Bay SPA/Ramsar. In 2019 a Main Modifications HRA was prepared by AECOM in support of the DaSA Local Plan[13]. This concluded that they will not lead to likely significant effects on European sites and do not undermine the conclusions of the HRA of the submitted DaSA.	
Sevenoaks District Council	The Core Strategy was adopted by Full Council on 22 February 2011. On 4 October 2022 the agenda and reports pack for Development and Conservation Advisory Committee have been published.	10,568 dwellings over the plan period.	An HRA was prepared alongside the Plan[14]. This HRA focused LSEs associated with an increase in atmospheric pollution from an increase in traffic flow and an increased recreational pressure at Ashdown Forest SAC and SPA. Following an Appropriate Assessment which focused on an assessment of traffic, air quality and recreational survey data and zones of influences, the HRA concluded there would be no adverse effects upon the integrity of Ashdown Forest SAC and SPA as a result of the Sevenoaks District Local Plan.	Possible air quality in-combination LSEs.

[13] AECOM. 2019. Habitat Regulations Assessment. Addendum Rother Development and Site Allocations Plan. Main Modifications Rother District Council

[14] AECOM. 2019. Habitats Regulations Assessment of the Sevenoaks District Local Plan 2015-2035. Sevenoaks District Council

Plans and Policies	Plan Status	Proposed development – Key elements of the Plan that could cause in-combination effects	Summary of HRA findings	Potential in-combination Likely Significant Effect (LSE)
Tunbridge Wells Borough Council	Tunbridge Wells Borough Council is in the process of updating its local plan. The new Local Plan has been through three previous periods of public consultation, and most recently has been submitted for independent examination. Following examination of the local plan it is expected that the Plan will be adopted by the Council in January 2023.	678 dwellings per year – 12,200 dwellings over the plan period. 14 hectares (80,000-120,000sqm) of employment land.	An HRA was undertaken in support of the Draft Local Plan by AECOM in 2019[15]. This HRA focuses on the following European sites: - Ashdown Forest SAC; and - Ashdown Forest SPA. The following impact pathways were considered: - Increase in atmospheric pollution from an increase in traffic flow; and - Increased recreational pressure. This assessment drew on traffic and air quality modelling data. Overall it concluded that the Local Plan would not result in an adverse effect on the integrity of the Ashdown Forest SPA / SAC through recreational pressure / disturbance either alone or 'in- combination' with other Local Plans.	Possible air quality in-combination LSEs.
Wealden District Council	The Council's current statutory development plan consists of the adopted Wealden District Core Strategy Local Plan (February, 2013), the 'saved' policies of the adopted Wealden Local Plan (1998) and the Affordable Housing	Housing numbers set out in the Core Strategy are out of date. The standard methodology provides a minimum figure for Wealden District to deliver of 1,231 dwellings per annum (this is the	HRA work was undertaken to accompany the Strategic Sites Local Plan and the Wealden Local Plan. This work was extensive and included air quality, visitor survey and ecological work focusing specifically on Ashdown Forest SAC and SPA[16]. In terms of the HRA the planning inspector noted that her "central concern was in respect of the legal compliance of the plan relates to the lack of constructive engagement with neighbouring authorities and	Possible air quality in-combination LSEs.

[15] AECOM. 2019. Habitat Regulations Assessment of the Regulation 18 Tunbridge Wells Local Plan.

[16] Wealden District Council. Planning Evidence Base. HRA. https://www.wealden.gov.uk/planning-and-building-control/planning-policy/planning-policy-evidence-base/habitat-regulations-assessment/

Plans and Policies	Plan Status	Proposed development – Key elements of the Plan that could cause in-combination effects	Summary of HRA findings	Potential in-combination Likely Significant Effect (LSE)
	Delivery Local Plan (May, 2016). Wealden District Council has worked on the Strategic Sites Local Plan and the Wealden Local Plan that both reached the Examination in Public (EiP) stage of the plan-making process but were later withdrawn by the Council on 27 May 2015 and on 19 February 2020 respectively. The Council is currently preparing a new Local Plan that will incorporate a full review of the existing planning policies within Wealden District. The current adopted LDS is being revised with an updated timetable and will detail the new deadline for undertaking a Regulation 18 Consultation on a Draft Local Plan.	2019/20 figure and due to be updated by MHCLG – though not expected to change significantly).	Natural England in respect of impacts on habitats and landscape and in respect of the issue of unmet housing need in Eastbourne." "against the advice of Natural England – on an emissions model which did not allow for emission improvements over time, a position which was "in scientific terms lacking credibility" She added there were other examples of "inadequate engagement" with Natural England and she raised concern about the way the council approached cross-boundary issues with other authorities. The inspector said the council held significant amounts of data which could potentially be of use to other local planning authorities to support work on strategic the cross-boundary matter of air quality, with particular reference to impacts on the Ashdown Forest. But, she said, the council did not share the information on a constructive basis with all its fellow members of the Ashdown Forest Working Group (AFWG). In addition, a session, to discuss mitigation measures to offset alleged impacts on the atmospheric pollution of two Special Areas of Conservation, Lewes Downs, and Pevensey Levels, was held too late for the local planning authorities to undertake meaningful engagement as policies had already been drafted.	
Epsom and Ewell District Council	Epsom and Ewell District Council are currently reviewing their local plan. Their draft Local Plan is due for consultation soon. Following a delay to public consultation this is now due	The Draft version of the Local Plan identifies the quantum of development required over the Plan period, making provision for 579 dwellings per annum, new industrial and retail floorspace and	The following European sites have been screened in as they were identified as having an LSE and will be explored again at Regulation 19: - Mole Gap to Reigate Escarpment SAC screened in for air quality, and public access; - Thames Basin Heaths SPA screened in for air quality;	Possible air quality, recreation and water in-combination LSEs.

Plans and Policies	Plan Status	Proposed development – Key elements of the Plan that could cause in-combination effects	Summary of HRA findings	Potential in-combination Likely Significant Effect (LSE)
	to start in early February 2023.	school provision. This includes approximately 11,580 residential units by 2037. This includes 4,600 - 4,700 units on strategic greenfield sites.	- Wimbledon Common SAC screened in for air quality and hydrology; and - South West London Waterbodies SPA and Ramsar screened in for air quality.	
Chichester District Council	Chichester District Council Local Plan review. Issues and Options complete. Preferred approach underway. The Preferred Approach version of the Chichester Local Plan Review was published for consultation from 13 December 2018 to 7 February 2019. The responses to this consultation have been considered and a report to the council was published in December 2019.	The housing target for the Plan Area is to provide for at least 12,350 dwellings to be delivered in the period 2016-2035. Provisions will be made for a net additional 145,835 sqm of new floorspace for uses in the B Use Classes (B1,B2 and B8. For the period up to 2026 provision will be made for 9,500 sq.m (gross) of comparison retail floorspace at Chichester city, through provision at Southern Gateway and other opportunity sites, taking account of the sequential test.	An HRA was undertaken by AECOM to support the Local Plan review[17]. This identified a number of policy recommendation to ensure no adverse impacts on any European site alone or in-combination. These related to recreational pressure, loss of functionally linked supporting habitat for birds and water quality at the Chichester and Langstone Harbour European sites and Pagham Harbour European sites. It also identified the requirement for further air quality modelling to assess air quality impacts at Butser Hill SAC, Ebernoe Common SAC and The Mens SAC.	Possible water in-combination LSEs.

[17] AECOM. 2018. Habitats Regulations Assessment Chichester Local Plan Review. Available at: http://www.chichester.gov.uk/CHttpHandler.ashx?id=30918

Plans and Policies	Plan Status	Proposed development – Key elements of the Plan that could cause in-combination effects	Summary of HRA findings	Potential in-combination Likely Significant Effect (LSE)
Arun District Council Local Plan	The Arun Local Plan was adopted in July 2018.	The Local Plan sets out provisions for the delivery of 20,000 new homes over the plan period (2011 – 2031).	An HRA was prepared in support of the Local Plan[18]. This screened out all sites except for Pagham Harbour SPA/Ramsar as being unlikely to be significantly affected by development within the district associated with the Local Plan. The HRA report there focused on Pagham Harbour SPA/Ramsar only. Following consideration of avoidance and mitigation measures the HRA concludes that there would be no adverse effect on the integrity of the SPA or Ramsar.	Possible water in-combination LSEs.
Waverley Borough Council Local Plan	Local Plan Part 1: Strategic Policies and Sites was adopted in February 2018. Local Plan Part 2: Site Allocations and Development Management Policies is currently in preparation. This was submitted to the Secretary of State for Levelling Up, Housing and Communities for Examination on 22 December 2021. Public consultation on the Schedule of Main Modifications to the	Local Plan Part 1: Strategic Policies and Sites was adopted in 2018 and contains strategic sites along with an allocation for 11,210 net additional dwellings which will be delivered within each parish over the plan period (2013-2032). 16,000sqm of new land for B class employment uses. Part 2 sets out provision of 11,210 net additional	An HRA was prepared in support of Local Plan Part 2 by AECOM in 2020[19]. This built on the findings of the Local Plan Part 1 HRA[20]. This screened in a number of allocations for further assessment for LSEs on the following European sites: - Thames Basin Heaths SPA; - Wealden Heaths SPA; - Thursley, Ash, Pirbright & Chobham SAC; - Ockley Bogs Ramsar site The HRA report focused on urbanisation and recreational pressure impacts. It concluded, taking into consideration the impact of policies, that there would be no adverse effect on the integrity of any European site alone or in-combination.	Possible air quality in-combination LSEs.

[18] UE Associates. 2013. Habitats Regulations Assessment for the Arun Local Plan.

[19] AECOM. 2020. Habitats Regulations Assessment Waverley Borough Council Local Plan Part 2. Available at: https://www.waverley.gov.uk/Portals/0/Documents/services/planning-and-building/planning-strategies-and-policies/local-plan/Habitats_Regulations_Assessment__HRA____Regulation_19__2020_.pdf?ver=euG08idDvkpYsGRJz6tyiw%3d%3

[20] AECOM. 2017. Habitats Regulations Assessment. Waverley Borough Council Local Plan Part 1: Strategic Policies and Sites: Additional Housing Habitats Regulations Assessment Addendum.

Plans and Policies	Plan Status	Proposed development – Key elements of the Plan that could cause in-combination effects	Summary of HRA findings	Potential in-combination Likely Significant Effect (LSE)
	local plan will take place until 27 January 2023.	homes, an average of 590 a year over the plan period.		
South Downs National Park Authority Local Plan and Policies Map	South Downs Local Plan was adopted in 2019.	The Local Plan will deliver 4,750 over the plan period.	An HRA was prepared in support of the SDNP Local Plan[21]. This included an appropriate assessment of a number of European sites with a focus on air quality, hydrology, loss of functionally linked land, urbanisation and renewable energy development impacts. This assessment made no recommendations made for further changes to the plan itself. However, a number of recommendations were made for initiatives to be taken forward either strategically or via more detailed project-level HRA for individual planning applications.	Possible water in-combination LSEs.
West Sussex Joint Minerals Local Plan	West Sussex Joint Minerals Local Plan was formally adopted in 2018.	This plan identifies minerals extraction and safeguarding areas across the County. It also contains a series of development management policies.	An HRA was undertaken in support of the Joint Minerals Plan in 2016[22]. This screened out all sites when considered alone. However, one site was screened in for in combination effects with other sites, projects and plans - East of West Heath Common. This was due to possible air quality impacts on the Wealden Heaths Phase 2 SPA or Woolmer Forest SAC. Neither European sites is considered in the Crawley Borough Council HRA.	Possible air quality and water LSEs in-combination.
West Sussex Waste Local Plan	West Sussex Waste Local Plan. Formally was adopted in April 2014. A five year review of this plan took place in 2019 which concluded that	This plan identifies waste allocation sites across the County. It also contains a	An HRA was undertaken in support of the Waste Local Plan in 2012[23]. This provided an assessment of waste sites upon European sites from atmospheric emissions, water quality and flows, predation from gulls	Possible air quality and water LSEs in-combination.

[21] AECOM. 2016. West Sussex Joint Minerals Local Plan Habitats Regulations Assessment.

[22] AECOM. 2018. South Downs National Park Authority Local Plan Habitats Regulations Assessment.

[23] URA. 2012. West Sussex Waste Local Plan. Habitats Regulations Assessment.

Plans and Policies	Plan Status	Proposed development – Key elements of the Plan that could cause in-combination effects	Summary of HRA findings	Potential in-combination Likely Significant Effect (LSE)
	the plan remains relevant and effective with no updates required.	series of development management policies.	and corvids, disturbance, direct land take and coastal squeeze. It focused on the following European sites: - Ebernoe Common SAC; - The Mens SAC; - Solent Maritime SAC; - Chichester and Langstone Harbours SPA/Ramsar; - Pagham Harbour SPA/Ramsar; - Singleton and Cocking Tunnels SAC; and - Arun Valley SPA/Ramsar. The HRA made recommendations in terms of strengthening of policy wording. On the basis of this it concluded that an adequate policy framework is in place to enable a conclusion of 'no likely significant effect alone or in combination' to be drawn regarding the Waste Local Plan.	
West Sussex Transport Plan[24].	The West Sussex Transport Plan 2022 - 2036 sets out how the County Council intends to address key challenges by improving, maintaining and managing the transport network in the period up to 2036. We will do this by working with our strategic partners, particularly in relation to funding. It was adopted in 2022.	The Transport Plan's aims for Crawley are to promote a shift to sustainable modes of transport (through improvements to bus priorities, improved public transport interchanges and rail services), enhance active travel options (walking and cycling), deliver air quality improvements, provide	The outcomes of the HRA for the Transport Plan are set out in Sustainability Appraisal[25]. The full HRA is not publicly available. The HRA concludes no further assessment is required in relation to Crawley Area Strategy as no potential LSE were identified.	Possible air quality LSEs in-combination.

[24] West Sussex County Council. 2022. West Sussex Transport Plan 2022 - 2036. Available at: https://www.westsussex.gov.uk/about-the-council/policies-and-reports/roads-and-travel-policy-and-reports/west-sussex-transport-plan/ [Date Accessed: 12/01/23]

[25] WSP. March 2022. West Sussex Transport Plan. Sustainability Appraisal. Available at: https://www.westsussex.gov.uk/media/17536/wstp_sa.pdf [Date Accessed: 12/01/23]

Plans and Policies	Plan Status	Proposed development – Key elements of the Plan that could cause in-combination effects	Summary of HRA findings	Potential in-combination Likely Significant Effect (LSE)
		elective vehicle infrastructure and manage on street parking and implement traffic management techniques.		
SES Water – Revised Draft Water Resources Management Plan 2019[26] Consultation on the 2025 – 2075 WRMP is currently underway[27].	A consultation will take place from 14 November 2022 to 20 February 2023 on the 2025-2075 WRMP.	Sutton and East Surrey Water (SES) have prepared a WRMP which sets out how they will secure water supplies from 2025 - 2075. During the next five years to 2025 SES Water will continue to implement demand management initiatives to achieve further leakage and water efficiency savings.	An HRA for SES WRMP is not publicly available, and as a result has not informed this HRA report. A review of key information has been undertaken as part of the WCS[28] and is summarised here in support of the HRA: - For the purposes of water resource planning, the SESW supply area has been divided into 2 Water Resource Zones (WRZ). - Currently, SESW supply 707,000 consumers in over 286,000 properties. At present, 85% of the water supplied is being extracted from groundwater resources and 15% from Bough Beech Reservoir, supplied by a pumped river abstraction from the River Eden in Kent. - The total number of households is expected to increase from 263,000 to 447,000, a 64% increase over the 60-year plan period. - There is a forecast surplus until 2048/49 and after this point there is a deficit. By the end of the plan period, there is a projected deficit of 22.7 Ml/d.	Possible water LSEs in-combination.

[26] Sutton and East Surrey Water. Draft Water Resources Management Plan (2019)

[27] Sutton and East Surrey Water. Draft Water Resources Management Plan 2022. Main Report. Issue No.3.

[28] JBA Consulting (August 2020). Gatwick Sub-Region Water Cycle Study. Final Report.

Plans and Policies	Plan Status	Proposed development – Key elements of the Plan that could cause in-combination effects	Summary of HRA findings	Potential in-combination Likely Significant Effect (LSE)

			- SESW has considered options that could resolve the supply-demand deficit. These options explore enhancing supplies or reducing demand separately.
			- Supply-Side Options:
			  o Abstraction at new or existing sites, and those where new or additional treatment would result in an increase in yield
			  o Water treatment options
			  o Pipeline transfer and bulk supplies
			- Demand-Side Options:
			  o Leakage management and reduction
			  o Improved household and non-household water efficiency
			  o Tariffs for sprinkler use or increasing volumetric charges
			  o Metering and smart metering
			  o Rainwater harvesting or greywater recycling.
			- A preferred programme of fourteen demand and supply options, plus a strategic transfer to South East Water, was taken forward for public consultation.
			- SESW model outputs show that the identified demand management measures are sufficient to solve the deficit in the baseline supply-demand. The plan, at a cost of £170.2M, results in a surplus of over 7 Ml/d under average conditions by 2080.	

Southern Water – Water Resource	Published.	Southern Water Propose a range of interventions including leakage reductions, significant demand management and	A review of key information has been undertaken as part of the WCS[30] and is summarised here in support of the HRA: - Southern Water is responsible for supplying the entirety of Horsham and most of Crawley. A small portion of southern Mid Sussex is also supplied by Southern Water.	Possible water LSEs in-combination.

[30] Ibid.

Plans and Policies	Plan Status	Proposed development – Key elements of the Plan that could cause in-combination effects	Summary of HRA findings	Potential in-combination Likely Significant Effect (LSE)
Management Plan 2020[29]		new resource developments, and water trading across its Eastern, Central and Western areas of supply. The need for these is due to a combination of changes to abstraction licences, increasing demand, the effects of climate change, and expected further reductions in the water available for use from existing sources as a result of licence changes to protect and enhance the environment. The most significant driver for the proposed strategies in the WRMP is licence changes.	- For the purposes of water resource planning, the Southern Water supply area is divided into fourteen WRZs. These fourteen WRZs have been amalgamated into three larger sub-regional supply areas. - The Gatwick Sub-Region is covered by the Sussex North WRZ and Sussex Brighton WRZ, two of three WRZs forming the Central supply area. - Southern Water is mainly dependant on groundwater sources in the chalk aquifer, and this makes up 70% of the total water supply. River abstraction accounts for 23% of water supply. Four surface water impounding reservoirs provide the remaining 7% water supply in the Southern Water supply area. - Southern Water anticipate that in the Central Area, the supply demand balance would move into deficit early in the planning period, with a further decrease anticipated as a result of potential sustainability reductions in 2027-28. - Southern Water have assessed a range of options to both increase water supply and reduce water demand. - A number of schemes are included within the strategy for the Central supply: - Target 100 - Southern Water have committed in their WRMP to water efficiency policy that aims to achieve a per capita consumption (PCC) of 100 l/p/d by 2040. An HRA was undertaken alongside the development of this Plan[31]. This concluded that as individual schemes are taken forward for further detailed design, the finer details of the required mitigation measures will need to be developed in dialogue with Natural England and the site operators/owners and secured during the project-stage	

[29] Southern Water. Water Resource Management Plan 2020: Technical Overview

[31] Southern Water. 2019. Water Resources Management Plan 2019 Annex 15: Habitats Regulations Assessment Main Report.

Plans and Policies	Plan Status	Proposed development – Key elements of the Plan that could cause in-combination effects	Summary of HRA findings	Potential in-combination Likely Significant Effect (LSE)
			HRA when a detailed design and construction method statement will be developed.	

South East Water – Water Resources Management Plan 2020 to 2080[32]	Draft water plan to replace WRMP14 was consulted upon in 2018.	The draft water resources management plan (dWRMP19) sets out how SEW plan to secure water supplies from 2020 to 2080. The long-term forecast shows there is insufficient water available to meet demand, and therefore there is a risk of not meeting supply. Therefore, the WRMP sets out a range of demand management measures and new water supply options that could meet that shortfall in available water.	A review of key information has been undertaken as part of the WCS[33] and is summarised here in support of the HRA:
			- For the purposes of water resource planning, the South East Water supply area is divided into eight Water Resource Zones.
			- The Gatwick Sub-Region study area is covered by the Haywards Heath WRZ.
			- The SEW WRMP75 states that 73% of the supply comes from groundwater sources from more than 250 boreholes and wells, 19% is from surface water abstractions, including six river intakes, three surface water reservoirs and 8% from neighbouring water companies.
			- Across the entirety of the supply area, a deficit is reached at 2044/45 for both dry year annual average and summer peak period.
			- South East Water has defined a preferred plan to address the future deficit of water supply. This plan includes:
			    ○ Adopting a mix of demand management and supply side options
			    ○ Addressing deficits in both dry year annual average and summer peak period for all WRZs across the plan period
			An HRA[34] was undertaken in parallel to the development of the WRMP and found that none of the WRMP preferred plan options would result
				Possible water LSEs in-combination.

[32] South East Water. Water Resources Management Plan 2020 to 2080

[33] Ibid.

[34] South East Water. 2019. Water Resources Management Plan 2020 to 2080 Strategic Environment Assessment Environmental Report. Appendix A.

Plans and Policies	Plan Status	Proposed development – Key elements of the Plan that could cause in-combination effects	Summary of HRA findings	Potential in-combination Likely Significant Effect (LSE)
			in significant effects on Natura 2000 sites and no further assessment is required.	
Thames RBMP[35]	Published.	The RBMP provides a framework for protecting and enhancing the benefits provided by the water environment.	An HRA was prepared alongside the development of the Thames RBMP[36]. This HRA identified potential hazards associated with implementation of the measures in the RBMP. These hazards were noted to be associated with the types of measures that are related to each significant water management issue in the RBMP and indicate the potential levels of risk to the range of features of the network of European sites. The level of detail of the RBMP did not allow detailed consideration of effects on individual European sites. However, at the strategic level of the RBMP, the assessment undertaken allowed confidence that the measures could go ahead without harm to European sites, subject to more detailed scrutiny of mitigation options at the lower tier plan or project level. This conclusion was primarily drawn because the RBMP does not constrain where or how the measures are implemented, and the process for deferring HRA to lower tier plan or project level, where necessary, will provide for a range of mitigation options to be pursued at the lower tier plan or project level. It therefore concluded that, at the strategic plan level, when taking into consideration the range of potential mitigation options available, the RBMP is not likely to have any significant effects on any European sites, alone or in combination with other plans or projects.	Possible water LSEs in-combination.
Gatwick Airport Northern Runway	Nationally significant infrastructure project. A 6 week consultation on updated road designs was held in Summer 2022		The Gatwick Airport (GAL) Northern Runway is coming forward through a separate DCO process that is subject to examination as a nationally significant infrastructure project. The DCO has not yet been examined or determined. At the time of writing, and in light of the Covid pandemic, GAL has placed consultation on the DCO on hold.	Possible air quality LSEs in-combination.

[35] Defra and Environment Agency. December 2016. Thames River Basin District – River Basin Management Plan

[36] Environment Agency. 2015. River basin management plan for the Thames River Basin District Habitats Regulations Assessment Updated December 2015

Plans and Policies	Plan Status	Proposed development – Key elements of the Plan that could cause in-combination effects	Summary of HRA findings	Potential in-combination Likely Significant Effect (LSE)
			It is likely that the Gatwick Northern Runway would be a project with potentially serious effects (PPSE) as it would have the potential for a potentially serious effect on one or more European site alone. It is therefore likely that a PPSE will survive or fail the Integrity Test according to its effects alone. Given that the DCO has not been determined, the project has been placed on hold, and sufficient information is not available at the time of writing to allow a detailed in-combination assessment, it is considered reasonable to not consider the effect of this project in combination with the Local Plan. Were a DCO to eventually be consented (with a decision likely after adoption of our currently emerging Plan) then this project would need to be considered as part of a future plan review through an HRA in-combination assessment, should alone impacts be proven to be unlikely.	
Crawley Borough Council Green Infrastructure SPD[37]	The SPD was adopted in October 2016	n/a	The Green Infrastructure (GI) SPD provides further guidance on the applications of Policy ENV4 Open Space, Sports and Recreation and Policy ENV5 Provision of Open Space and Recreational Facilities in the Local Plan 2015-2030. The SPD sets out requirements for the following: - The Green Infrastructure Network - Trees - Open Space - Biodiversity - Countryside and AONB GI is illustrated on a GI map. The SPD notes that details of green infrastructure should be provided with the planning application, for example, within the Design and Access Statement to demonstrate how	Positive impacts for recreational provision

[37] Crawley Borough Council. 2016. Green Infrastructure SPD. Supporting the Crawley Borough Local Plan 2015 – 2030.

Plans and Policies	Plan Status	Proposed development – Key elements of the Plan that could cause in-combination effects	Summary of HRA findings	Potential in-combination Likely Significant Effect (LSE)
			green infrastructure has been addressed, cross-referring to any drawings. For large proposals, this is a requirement. When providing open space, the Green Infrastructure principles, should be applied to ensure that the greatest benefits for recreation and wildlife can be achieved.	
Open Space Study[38]	Final version prepared to support Local Plan.	n/a	This study comprises an assessment of the quantity, accessibility, quality and value of open space in Crawley and Crawley's neighbourhoods. It concludes that Natural Green Space covers 296.62ha and accounts for 44.85% of Crawley's open space provision. Play Space (Youth) provision is the lowest at 0.88ha, which provides 0.13% of Crawley's open space. The total quantity of open space within Crawley equates to 8.3ha per 1000 population. In regard to quality, it notes that most sites fall into the Fair banding (43%). The least number of sites fall into the Excellent (3%) and Very Good (9%) quality banding. The value banding comprises High, Medium and Low and the majority of sites fell into the Low category (64%). Accessibility to open space is noted to be generally high but with notable gaps of provision for typologies such as Allotments and Play Space (Youth), particularly in the northern part of Crawley due to Gatwick Airport and Manor Royal Business District. The study recommends that an SPD should be published to outline the requirements of developers to: - protect, replace or enhance open spaces impacted by their proposals; and - review local open space provision in regard to the increase in population.	Positive impacts for recreational provision

[38] The Environment Partnership. December 2020. Open Space, Sport and Recreational Assessment.

Plans and Policies	Plan Status	Proposed development – Key elements of the Plan that could cause in-combination effects	Summary of HRA findings	Potential in-combination Likely Significant Effect (LSE)
New Directions for Crawley. Transport and access for the 21st Century.	Published in support of the Local Plan.	n/a	This document looks at some of the issues presented by the current approach to travel and access in Crawley, suggests what a vision for the future might be, outlines some options for improvement and shows what could be delivered in the town over the next five years. The strategy aims to meet the following aims: 1. Improved sustainable travel infrastructure – prioritise walking and cycling network improvements and facilities, improving public transport access and services. 2. Smarter highway network management – managing demand, directions, speeds and inefficient road space allocation to address congestion and improve access and health of neighbourhoods and business districts. 3. Integrated transport and land use planning – ensure housing and business development centres on public transport links and walking and cycling networks as 'Transit Oriented Development' for improved access. "An ageing population, vehicle and energy technology, disruptive digital technologies, and the need for climate change resilience and adaptation will all present uncertainty". 4. Effective travel planning – working with business and other organisations to improve commuter, visitor, shopping and leisure choices and reduce single-occupancy car use. 5. Shared mobility – develop facilities such as car clubs and shared bikes, with electric vehicle charging to broaden choices beyond conventional private car use. Alongside support for: 6. Digital travel tools – developing Mobility as a Service (MaaS) and transport information provision to enable seamless travel, awareness and use of public transport services as they develop.	Positive air quality impacts

Plans and Policies	Plan Status	Proposed development – Key elements of the Plan that could cause in-combination effects	Summary of HRA findings	Potential in-combination Likely Significant Effect (LSE)
Crawley Local Cycling and Walking Infrastructure Plan (LCWIP) 2020	Published in support of the Local Plan.	n/a	The Local Cycling and Walking Infrastructure Plan (LCWIP) is a costed plan which identifies and prioritises physical infrastructure improvements in a specified area to enable a significant increase in cycling and walking. It has informed the CBC Local Plan, guiding building development. It will provide a clear rationale for investment to make streets safe and attractive for active travel and for collaborative working with the local transport authority. This transformation in transport infrastructure and the resulting shift to cycling and walking will help deliver significant reductions in carbon emissions and improvements in air quality, local community health and quality of life.	Positive air quality impacts

Appendix B: Habitat Site Conservation Objectives, Qualifying Features, Threats and Pressures

Ashdown Forest SAC[1]
Conservation objectives: 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 qualifying species; and • The distribution of qualifying species within the site. Qualifying Features: H4010. Northern Atlantic wet heaths with Erica tetralix; Wet heathland with cross-leaved heath H4030. European dry heaths S1166. *Triturus cristatus*; Great crested newt Threats and Pressures at Habitat site which may be affected by Local Plan[2,3]. • Air pollution – impact of nitrogen deposition and acidification; and • Public access and disturbance; and • Hydrological changes and water quantity and quality.

[1] Natural England (2018) Ashdown Forest SAC Conservation Objectives. Available at: http://publications.naturalengland.org.uk/publication/6183967367626752 [Date Accessed: 14/12/22]

[2] Natural England. 2014. Site Improvement Plan. Ashdown Forest SPA and SAC. http://publications.naturalengland.org.uk/file/6679502935556096 [Date Accessed: 14/12/22].

[3] Natural England. 2019. Ashdown Forest SAC Conservation Objectives Supplementary Advice. http://publications.naturalengland.org.uk/file/6494201252675584 Available at: [Date Accessed: 14/12/22]

Ashdown Forest SPA[4]
Conservation objectives: 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: A224 *Caprimulgus europaeus*; European nightjar (Breeding) A302 *Sylvia undata*; Dartford warbler (Breeding) Threats and Pressures at Habitat site which may be affected by Local Plan[5,6]. • Air pollution – impact of nitrogen deposition and acidification; and • Public access and disturbance; and • Hydrological changes and water quantity and quality.

[4] Natural England (2019) Ashdown Forest SPA Conservation Objectives. Available at: http://publications.naturalengland.org.uk/file/6233998355595264 [Date Accessed: 14/12/22]

[5] Natural England. 2014. Site Improvement Plan. Ashdown Forest SPA and SAC. http://publications.naturalengland.org.uk/file/6679502935556096 [Date Accessed: 14/12/22].

[6] Natural England. 2019. Ashdown Forest SPA Conservation Objectives Supplementary Advice. http://publications.naturalengland.org.uk/file/6754256153739264 Available at: [Date Accessed: 14/12/22]

Mole Gap to Reigate Escarpment SAC[7]

Conservation objectives:

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

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

Qualifying Features:

H4030. European dry heaths

H5110. Stable *xerothermophilous* formations with Buxus sempervirens on rock slopes (*Berberidion p.p.*); Natural box scrub

H6210. Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco-Brometalia*) (important orchid sites); Dry grasslands and scrublands on chalk or limestone (important orchid sites)

H9130. *Asperulo-Fagetum* beech forests; Beech forests on neutral to rich soils H91J0. *Taxus baccata* woods of the British Isles; Yew-dominated woodland*

S1166. *Triturus cristatus*; Great crested newt
S1323. *Myotis bechsteinii*; Bechstein`s bat

Threats and Pressures at Habitat site which may be affected by Local Plan[8,9].

- Air pollution – impact of nitrogen deposition and acid deposition; and
- Public access and disturbance;
- Water quantity and quality;
- Illumination; and
- Disturbance from human activity.

[7] Natural England (2018) Mole Gap to Reigate Escarpment SAC Conservation Objectives. Available at: http://publications.naturalengland.org.uk/file/5690871244914688 [Date Accessed: 14/12/22]

[8] Natural England. 2014. Site Improvement Plan. Mole Gap to Reigate Escarpment SAC. http://publications.naturalengland.org.uk/file/6256378880458752 [Date Accessed: 14/12/22].

[9] Natural England. 2019 Mole Gap to Reigate Escarpment SAC Conservation Objectives Supplementary Advice. http://publications.naturalengland.org.uk/file/635445039883878 Available at: [Date Accessed: 14/12/22]

South West London Waterbodies SPA[10]

Conservation objectives:

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:

A051 Anas strepera; Gadwall (Non-breeding)

A056 Anas clypeata; Northern shoveler (Non-breeding)

Threats and Pressures at Habitat site which may be affected by Local Plan[11,12].

- Air pollution – impact of nitrogen deposition and acid deposition; and
- Public access and disturbance / disturbance by human activity; and
- Water quantity, depth and quality.

[10] Natural England (2019) South West London Waterbodies SPA Conservation Objectives. Available at: http://publications.naturalengland.org.uk/file/5411059804667904 [Date Accessed: 14/12/22]

[11] Natural England. 2014. Site Improvement Plan. South West London Waterbodies SPA. http://publications.naturalengland.org.uk/file/5135484288237568 [Date Accessed: 14/12/22].

[12] Natural England. 2018 South West London Waterbodies SPA Conservation Objectives Supplementary Advice. http://publications.naturalengland.org.uk/file/5893345162821632 Available at: [Date Accessed: 14/12/22]

South West London Waterbodies Ramsar[13]

Ramsar sites do not have the Conservation Objectives in the same way as SPAs and SACs. Information regarding the designation of Ramsar sites is contained in INCC Ramsar Information Sheets. Ramsar Criteria are the criteria for identifying Wetlands of International Importance. The relevant criteria and ways in which this site meets the criteria are presented in the table below.

Ramsar Criterion	Justification for the application of each criterion
6	Ramsar criterion 6 – species/populations occurring at levels of international importance. Qualifying species/populations (as identified at designation): Species with peak counts in spring/autumn: Northern shoveler, Anus clypeata, Northwest and Central Europe - 397 individuals, representing an average of 2.6% of the GB population (5 year peak mean 1998/9-2002/3) Species with peak counts in winter: Gadwall, Anas strepera strepera, Northwest Europe - 487 individuals, representing an average of 2.8% of the GB population (5 year peak mean 1998/9- 2002/3).

Threats and Pressures at Habitat site which may be affected by Local Plan.

- None identified in Ramsar information sheet.

[13] JNCC. 2008. Information Sheet on Ramsar Wetlands. South West London Waterbodies https://jncc.gov.uk/jncc-assets/RIS/UK11065.pdf [Date Accessed: 14/12/22].

Arun Valley SAC[14]
Conservation objectives: 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 qualifying species; and • The distribution of qualifying species within the site. Qualifying Features: S4056. *Anisus vorticulus*; Little whorlpool ram's-horn snail Threats and Pressures at Habitat site which may be affected by Local Plan[15,16]. • Water levels; and • Water pollution.

[14] Natural England (2018) Arun Valley SAC Conservation Objectives. Available at: http://publications.naturalengland.org.uk/file/6136148019904512 [Date Accessed: 14/12/22]

[15] Natural England. 2014. Site Improvement Plan. Arun Valley. http://publications.naturalengland.org.uk/file/5185212862431232 [Date Accessed: 14/12/22].

[16] Natural England. 2019. Arun Valley SAC. Conservation Objectives Supplementary Advice. http://publications.naturalengland.org.uk/file/625784661868544 Available at: [Date Accessed: 14/12/22]

Arun Valley SPA[17]

Conservation objectives:

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:

A037 *Cygnus columbianus bewickii*; Bewick's swan (Non-breeding)
Waterbird assemblage (including: *Shoveler Anas clypeata, Teal Anas crecca, Wigeon Anas penelope, Bewick's Swan Cygnus columbianus bewickii*).

Threats and Pressures at Habitat site which may be affected by Local Plan[18,19].

- Water depth, quantity and quality;
- Hydrology and flow; and
- Public access and disturbance.

[17] Natural England (2019) Arun Valley SPA Conservation Objectives. Available at: http://publications.naturalengland.org.uk/file/5120675857825792 [Date Accessed: 14/12/22]

[18] Natural England. 2014. Site Improvement Plan. Arun Valley. http://publications.naturalengland.org.uk/file/5185212862431232 [Date Accessed: 14/12/22].

[19] Natural England. 2019. Arun Valley SPA. Conservation Objectives Supplementary Advice. http://publications.naturalengland.org.uk/file/658924572481945 Available at: [Date Accessed: 14/12/22]

Arun Valley Ramsar[20]

Ramsar sites do not have the Conservation Objectives in the same way as SPAs and SACs. Information regarding the designation of Ramsar sites is contained in INCC Ramsar Information Sheets. Ramsar Criteria are the criteria for identifying Wetlands of International Importance. The relevant criteria and ways in which this site meets the criteria are presented in the table below.

Ramsar Criterion	Justification for the application of each criterion
2	The site holds seven wetland invertebrate species listed in the British Red Data Book as threatened. One of these, Pseudamnicola confusa, is considered to be endangered. The site also supports four nationally rare and four nationally scarce plant species
3	In addition to the Red Data Book invertebrate and plant species, the ditches intersecting the site have a particularly diverse and rich flora. All five British duckweed Lemna species, all five water-cress Rorippa species, and all three British water milfoils (Myriophyllum species), all but one of the seven British water dropworts (Oenanthe species), and two-thirds of the British pondweeds (Potamogeton species) can be found on site.
5	Ramsar criterion 5 – Assemblages of international importance: Species with peak counts in winter: 13774 waterfowl (5 year peak mean 1998/99-2002/2003)
6	Ramsar criterion 6 – Species/populations identified subsequent to designation for possible future consideration under criterion 6. Species with peak counts in winter: Northern pintail , Anas acuta, NW Europe - 641 individuals, representing an average of 1% of the population (5 year peak mean 1998/9- 2002/3)

Threats and Pressures at Habitat site which may be affected by Local Plan[21].

- Water abstraction for public supply.

[20] JNCC. 2008. Information Sheet on Ramsar Wetlands. Arun Valley https://jncc.gov.uk/jncc-assets/RIS/UK11004.pdf [Date Accessed: 14/12/22].

[21] JNCC. 2008. Information Sheet on Ramsar Wetlands. Arun Valley https://jncc.gov.uk/jncc-assets/RIS/UK11004.pdf [Date Accessed: 14/12/22].

The Mens SAC[22]
Conservation objectives: Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; • The extent and distribution of qualifying natural habitats and habitats of qualifying species; • The structure and function (including typical species) of qualifying natural habitats; • The structure and function of the habitats of qualifying species; • The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely; • The populations of qualifying species; and • The distribution of qualifying species within the site. Qualifying Features: H9120. Atlantic acidophilous beech forests with Ilex and sometimes also Taxus in the shrublayer (*Quercion robori-petraeae* or *Ilici-Fagenion*); Beech forests on acid soils S1308. *Barbastella barbastellus*; Barbastelle bat Threats and Pressures at Habitat site which may be affected by Local Plan[23,24]. • Public access and disturbance; and • Air quality; • Hydrology; and • Illumination.

[22] Natural England (2018) The Mens SAC Conservation Objectives. Available at: http://publications.naturalengland.org.uk/file/4643646439948288 [Date Accessed: 14/12/22]

[23] Natural England. 2015. Site Improvement Plan. The Mens SAC. http://publications.naturalengland.org.uk/file/6144692196474880 [Date Accessed: 14/12/22].

[24] Natural England. 2019. The Mens SAC. Conservation Objectives Supplementary Advice. http://publications.naturalengland.org.uk/file/5113429933424640 Available at: [Date Accessed: 14/12/22]

Appendix C: Site of Special Scientific Interest Condition Data

Ashdown Forest SAC and Ashdown Forest SPA

SSSI Name	Conservation Status of SSSI Units[1]	Reason for unfavourable status where applicable.
Ashdown Forest SSSI	36 Favourable	n/a
Ashdown Forest SSSI	90 Unfavourable - recovering	n/a
Ashdown Forest SSSI	1 Unfavourable – declining	Deer grazing / browsing. Forestry and woodland management. Lack of corrective works and inappropriate scrub control.

Mole Gap to Reigate Escarpment SAC

SSSI Name	Conservation Status of SSSI Units	Reason for unfavourable status where applicable.
Mole Gap to Reigate Escarpment SSSI	23 Favourable	n/a
Mole Gap to Reigate Escarpment SSSI	13 Unfavourable - recovering	n/a
Mole Gap to Reigate Escarpment SSSI	1 Unfavourable – no change	Lack of corrective works – Inappropriate scrub control.

South West London Waterbodies SPA and Ramsar

SSSI Name	Conservation Status of SSSI Units	Reason for unfavourable status where applicable.
Knight & Bessborough Reservoirs SSSI	1 Favourable	n/a
Kempton Park Reservoirs SSSI	2 Unfavourable - recovering	Infestation of the invasive plant Crassula hemsii (New Zealand Pygmyweed) is thought to be having adverse affects on feeding conditions for Gadwall.
Staines Moor SSSI	4 Favourable	n/a
Staines Moor SSSI	1 Unfavourable - recovering	Investigation into the source of the inflow is still required to check water quality.
Staines Moor SSSI	1 Unfavourable – declining	Agriculture – inappropriate cutting/mowing and undergrazing.

[1] Natural England. IRX https://designatedsites.naturalengland.org.uk/. Site condition data is provided for the SSSIs which legally underpin the European designation [Date Accessed: 14/12/22].

		Lack of corrective works – inappropriate weed control.
Thorpe Park No.1 Gravel Pit SSSI	1 Favourable	n/a
Wraysbury and Hythe End Gravel Pits SSSI	6 Favourable	n/a
Wraysbury No.1 Gravel Pit SSSI	1 Favourable	n/a
Wraysbury reservoir SSSI	1 Favourable	n/a

Arun Valley SAC

SSSI Name	Conservation Status of SSSI Units	Reason for unfavourable status where applicable.
Amberley Wild Brooks SSSI	3 Favourable	n/a
Amberley Wild Brooks SSSI	11 Unfavourable - recovering	n/a
Pulborough Brooks SSSI	3 Favourable	n/a

Arun Valley SPA and Arun Valley Ramsar

SSSI Name	Conservation Status of SSSI Units	Reason for unfavourable status where applicable.
Amberley Wild Brooks SSSI	3 Favourable	n/a
Amberley Wild Brooks SSSI	11 Unfavourable - recovering	n/a
Pulborough Brooks SSSI	3 Favourable	n/a
Waltham Brooks SSSI	3 Unfavourable - recovering	n/a

The Mens SAC

SSSI Name	Conservation Status of SSSI Units	Reason for unfavourable status where applicable.
The Mens SSSI	11 Favourable	n/a
The Mens SSSI	1 Unfavourable – declining	Appropriate woodland management needs to be agreed.

Appendix D: Air Quality Report

Air Quality Modelling to support HRA:

Crawley Borough Council Local Plan

April 2021

Experts in air quality
management & assessment

Document Control

Client	Crawley Borough Council	Principal Contact	Samantha Cheater (Lepus Consulting Ltd)

Job Number	J4402

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Document Status and Review Schedule

Report No.	Date	Status	Reviewed by
J4402A/1/F4	26 April 2021	Final	Laurence Caird (Associate Director)

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1 Introduction

1.1 This report provides the air quality modelling methodology and results used to inform the Habitats Regulations Assessment (HRA) of the Regulation 19 version of the Crawley Borough Council Local Plan. The Local Plan will provide the basis for future planning decisions in the borough.

1.2 Specifically, the assessment is required to assess the impacts of the Local Plan on the following European protected ecological sites:

- Ashdown Forest Special Area of Conservation (SAC); and
- Mole Gap to Reigate Escarpment SAC (hereafter referred to as 'Mole Gap').

1.3 The report describes the overall scope of the air quality assessment, the detailed dispersion modelling methodology, and the model results. It has been prepared by Air Quality Consultants Ltd on behalf of Crawley Borough Council.

2 Scope of Assessment

Designated Sites

2.1 The assessment considers the potential for significant effects on European level designated habitats. These designated habitats include:

- Ashdown Forest (SAC); and
- Mole Gap (SAC).

2.2 A plan showing the designated sites is shown in Figure 1.

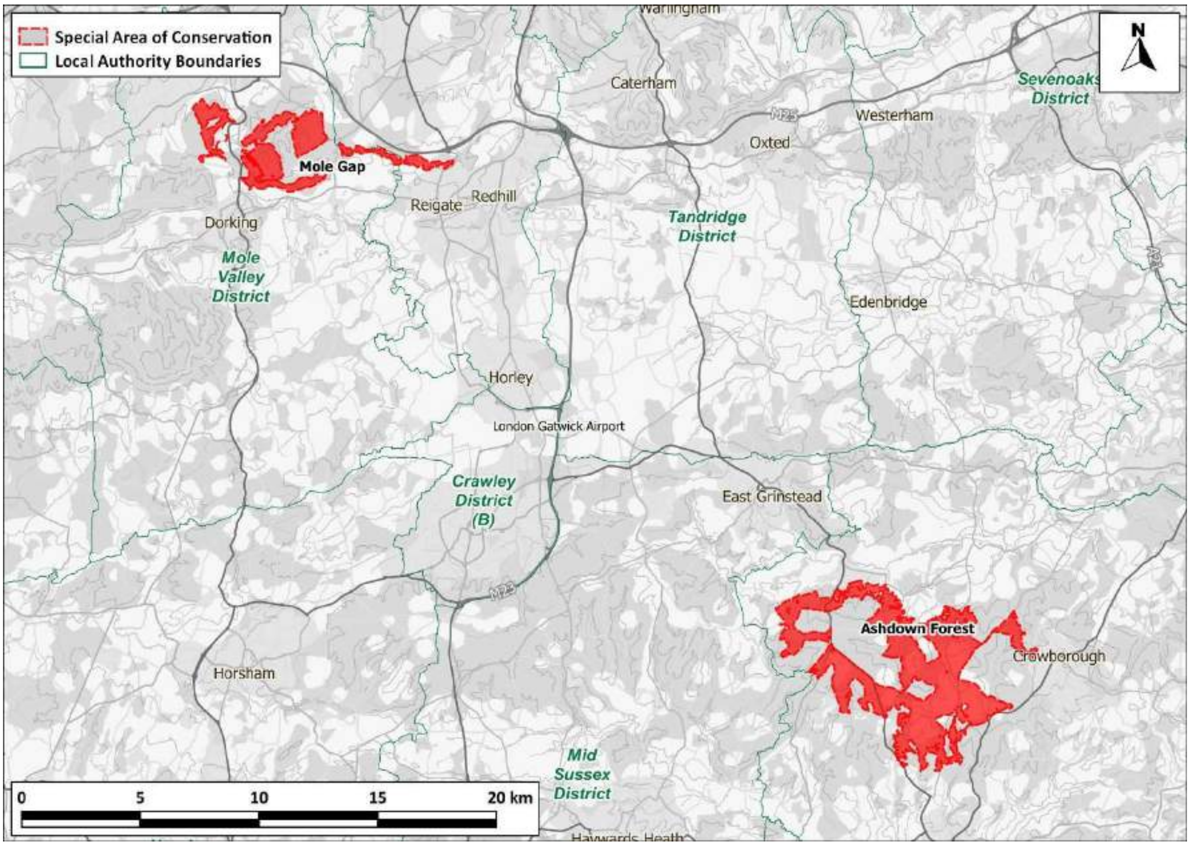

Figure 1: Relevant Designated Sites

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Pollutant Concentrations and Deposition Rates

2.3 The assessment determines the effects on the following pollutant concentrations and deposition rates which are related to exhaust pipe emissions from road traffic:

- Nitrogen oxides (NOx);

- Ammonia (NH_3);
- Nutrient nitrogen deposition (N-dep); and
- Acid deposition (A-dep).

Critical Loads and Levels

2.4 In relation to the above list of pollutants and deposition rates, the relevant Critical Levels and Critical Loads used in the assessment are provided in Table 1.

Table 1: Relevant Critical Levels and Critical Loads

Pollutant/ Deposition	Value	Notes	Site
Critical Levels			
Nitrogen Oxides	30 µg/m^3	n/a	All sites
Ammonia	1 µg/m^3	Ecosystems where sensitive lichens and bryophytes are an important part of the ecosystem integrity	All sites
Critical Loads			
Nutrient Nitrogen Deposition	10 kgN/ha/yr	Wet heath and dry heath	Ashdown Forest SAC
		Beech forest, dry heath	Mole Gap SAC
Acid Deposition	0.952 keq/ha/yr	Wet heath and dry heath	Ashdown Forest SAC
	1.449 keq/ha/yr	Dry heath	Mole Gap SAC

Assessment Years

2.5 The baseline year for the air quality modelling is 2015. This is consistent with the validation year for the Crawley Transport Model (CTM).

2.6 In terms of future years, the assessment focusses on a final assessment year of 2035, in which the Local Plan will be fully completed.

3 Air Quality Assessment Methodology

Traffic Data

3.1 Traffic data for the dispersion modelling have been provided by Stantec and have been derived from the Crawley Transport Model, which is a SATURN based highway assignment model.

3.2 A screening exercise was undertaken by Lepus Consulting following guidance from Natural England[1], in which screening thresholds of 1,000 Annual Average Daily Traffic (AADT) movements and 200 Heavy Duty Vehicle (HDV) movements were applied to strategic roads within 200 m of European protected ecological sites. Dispersion modelling has been carried out where either of these criteria were exceeded.

Dispersion Model

3.3 The latest version of the ADMS-Roads dispersion model (v5) has been used. This model, developed by Cambridge Environmental Research Consultants (CERC), is widely used in the UK for dispersion modelling of road traffic emissions.

Receptors

3.4 Transects of receptors have been identified within each of the relevant designated sites, moving away from the edge of each screened-in road. The use of transects allow the results to demonstrate the reduction in pollutant concentrations and deposition fluxes with distance from the road edge.

3.5 Receptor transects are perpendicular to the modelled roads and have been selected to be on road segments with a number of orientations, in order to account for variation in wind direction. For the same reason, in locations where the SAC is located on both sides of the road, receptor transects have also been placed on either side of the road.

3.6 In most cases, transects of receptors have been modelled at the following distances from the roads:

0 m, 1 m, 2 m, 3 m, 4 m, 5 m, 7 m, 10 m, 15 m, 20 m, 30 m, 50 m, 100 m, 150 m and 200 m.

3.7 However, in some cases, designated ecological sites are located some distance from roads. In order to ensure good resolution within the ecological site, receptor spacing has been varied to give the smallest receptor spacing in the section of the site closest to the road. Such detailed spacing is not needed between the road and the ecological site. For example, the Mole Gap SAC is located 63 m from the M25 and transect spacing from the M25 is as follows:

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1 Natural England (2018) Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations, Available: http://publications.naturalengland.org.uk/publication/4720542048845824

0 m, 10 m, 20 m, 30 m, 40 m, 50 m, 60 m, 63 m, 64 m, 65 m, 66 m, 67 m, 68 m, 70 m, 73 m, 78 m, 83 m, 88 m, 113 m, 163 m and 200 m.

3.8 Following the approach of Natural England, transects do not extend beyond 200 m from the road edge. IAQM guidance[2] recommends that receptors within 2 m of roads are excluded from the assessment, however for completeness, receptor transects begin at 0 m from the road edge.

Receptor Height

3.9 All receptors have been modelled at a height of 1.5 m, which is consistent with Defra's national modelling of ecosystem impacts.

Model Scenarios

3.10 Predictions for 2035 have been made for three scenarios:

- the Do-Nothing, which assumes no traffic growth between 2015 and 2035;
- the Do-Minimum, which includes committed development and background traffic growth to each assessment year, but no Local Plan traffic; and
- the Do-Something, which includes committed development and background traffic growth to each assessment year, plus the Local Plan traffic.

3.11 The results for the Do-Minimum and Do-Something scenarios have been compared against one-another to show the impacts of the Local Plan in isolation.

3.12 The in-combination assessment has been completed by comparing the results of the Do-Nothing and Do-Something scenarios.

Modelling Methodology

Modelled Road Network

3.13 The assessment focusses on impacts alongside the screened-in roads and, to ensure all future road traffic emissions are adequately captured, all screened-in roads are modelled to a distance of at least 350 m from any receptor transects.

3.14 The road networks modelled for both the Ashdown Forest and Mole Gap SACs are shown in Figure 2 and Figure 3.

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2 IAQM (2020), 'A guide to the assessment of air quality impacts on designated nature conservation sites' V1.1

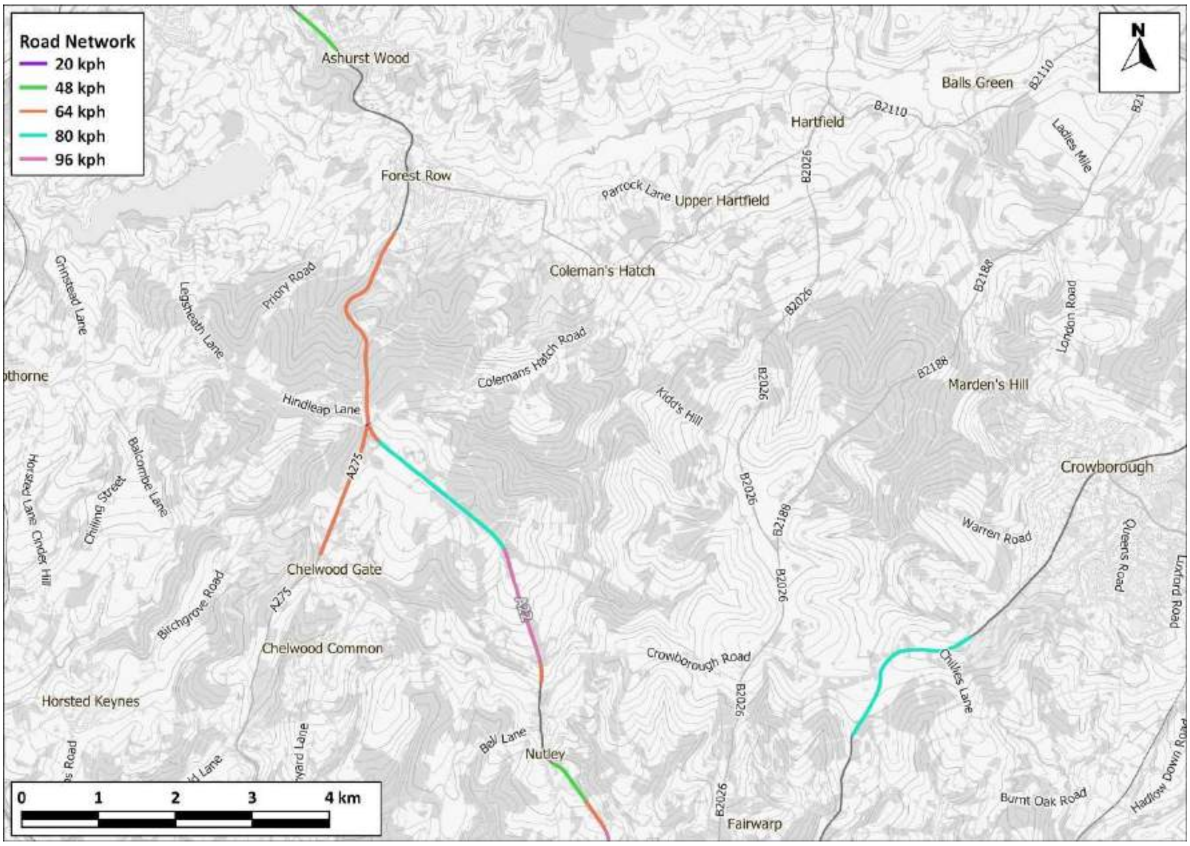

Figure 2: Ashdown Forest Modelled Roads

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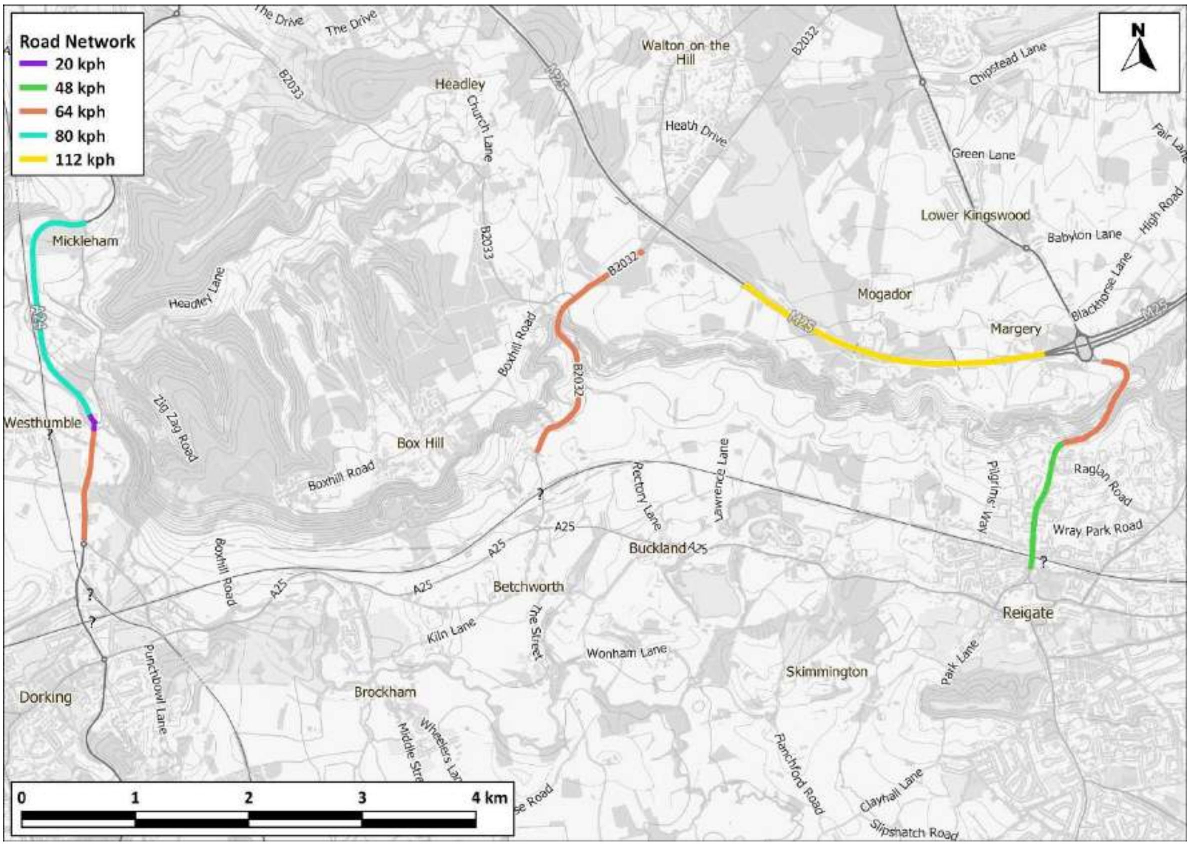

Figure 3: **Mole Gap Modelled Roads**

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Road Speeds

3.15 Traffic speeds have been estimated based on professional judgement, taking account of the road layout, speed limits and the proximity to a junction. Where appropriate, speeds on links close to junctions have been reduced to around 20 kph to account for queueing and additional emissions from vehicles accelerating from standstill or a low speed.

Gradients

3.16 Gradient emissions have not been included in the modelling. An initial screen of affected links through the sensitive habitats did not identify any road with a significant gradient.

Street Canyons

3.17 The roads through the affected sites are open roads with low-lying vegetation in the verges and do not represent canyon-like environments. The effects of street canyons have therefore not been considered in the model.

Emissions Factors

3.18 Road traffic NOx emissions for the modelling have been derived from the latest version of Defra's Emissions Factors Toolkit (EFT) (v10)[3]. Version 10 of the EFT does not include a transport fleet mix for 2015 (the assessment baseline year); in order to model the 2015 baseline, the 2015 UK vehicle fleet from Defra's EFT Version 8[4] has been imported into EFT v10 as a custom fleet mix and run to derive 2015 vehicle NOx emissions. The EFT only includes emissions up to 2030; these emissions have been used for the 2035 scenarios in order to provide a conservative assessment as NOx emissions are expected to reduce in the future.

3.19 Road traffic ammonia emissions for the modelling have been derived from the latest version of the Calculator for Road Emissions of Ammonia (CREAM) (v1A)[5].

3.20 The road type setting within both the EFT and CREAM has been set to 'Rural (not London)' for all roads with the exception of the M25, which has been set to 'London Motorway'.

3.21 CREAM only includes emissions for 'London Motorway' up to 2030. The road type setting for the M25 within CREAM has therefore been set to 'Motorway- not London' for all 2035 scenarios. This provides a conservative assessment as the emissions for 'Motorway – not London' in 2035 are greater than those for 'London Motorway' in 2030.

Other Model Inputs

Meteorological Data

3.22 Hourly sequential meteorological data from Gatwick Airport have been used in the dispersion modelling. The Gatwick Airport meteorological monitoring station is the closest in relation to Crawley and is representative of inland meteorology in south-eastern UK over flat topography (such as is seen throughout the study area).

3.23 Data for the year in which the model is verified (2015) have been used in the model.

Surface Roughness and Monin-Obukhov Length

3.24 Surface roughness varies from location to location depending on the features present in each part of the designated sites. A variable surface roughness file has been used for each site to represent the spatial variation of the surface roughness over each land type. The following parameters have been used in creating this file:

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3 Defra, 2020, Emissions Factors Toolkit Version 10.1: https://laqm.defra.gov.uk/review-and-assessment/tools/emissions-factors-toolkit.html

4 Defra, 2017, Emissions Factors Toolkit Version 8.0.1.

5 Air Quality Consultants (2020), Calculator for Road Emissions of Ammonia (CREAM) V1A: https://www.aqconsultants.co.uk/resources

- forest – 1 m;
- built-up area – 0.5 m;
- grassland – 0.2 m; and
- water – 0.0001 m.

3.25 A fixed surface roughness length has been used for the meteorological site. The applied surface roughness and minimum Monin-Obukhov length values are presented in Table 2.

Table 2: Other Model Input Parameters

Parameter	Location	Value (m)
Surface Roughness	Met Site	0.2
Minimum Monin-Obukhov Length	Met Site	30
	Ashdown Forest and Mole Gap SACs	10

3.26 Other model meteorological parameters such as Priestley Taylor parameter and Surface Albedo have been set to model defaults.

Terrain

3.27 Local terrain has been included within the model based on OS Terrain 50 data.

Model Post Processing

Model Verification

3.28 In order to ensure that ADMS-Roads accurately predicts local concentrations, it is necessary to verify the model against local measurements. Suitable air quality monitoring sites for model verification have been identified from the whole of the study area, which includes sites in Reigate and Banstead and Mid Sussex. In total, three local monitoring sites have been included in the verification, with two sites in Mid Sussex being used to verify the models for Ashdown forest and one monitoring site in Reigate and Banstead being used for Mole Gap. The verification sites have been chosen as those which best represent the roads that pass through the designated sites, which are largely free flowing A Roads, and which are not obscured by noise barriers.

3.29 The model verification involves a comparison of the predicted model outputs for road traffic NOx concentrations with the local measurements. The comparison is used to derive a model adjustment factor, which is subsequently applied to all model outputs for all scenarios to reduce model uncertainty.

3.30 There are no local NOx monitoring sites in the study area, so the approach to the model verification is to use local nitrogen dioxide monitoring sites (NOx = NO_2 + NO), and verify the model following the approach recommended in Defra's Local Air Quality Management Technical Guidance (TG16)[6]. The sites used in the model verification are presented in Table 3 and Figure 4.

Table 3: Local Monitoring Sites used in Model Verification

Site ID	Location	Local Authority	2015 NO_2 Concentration ($\mu g/m^3$)
MSAQ5	Lewes Road, East Grinstead	Mid Sussex	32.8
RB125	Opposite Reigate Hill Close	Reigate and Banstead	37.7
RB150	8 Elvington Lodge, Reigate Hill	Reigate and Banstead	34.8

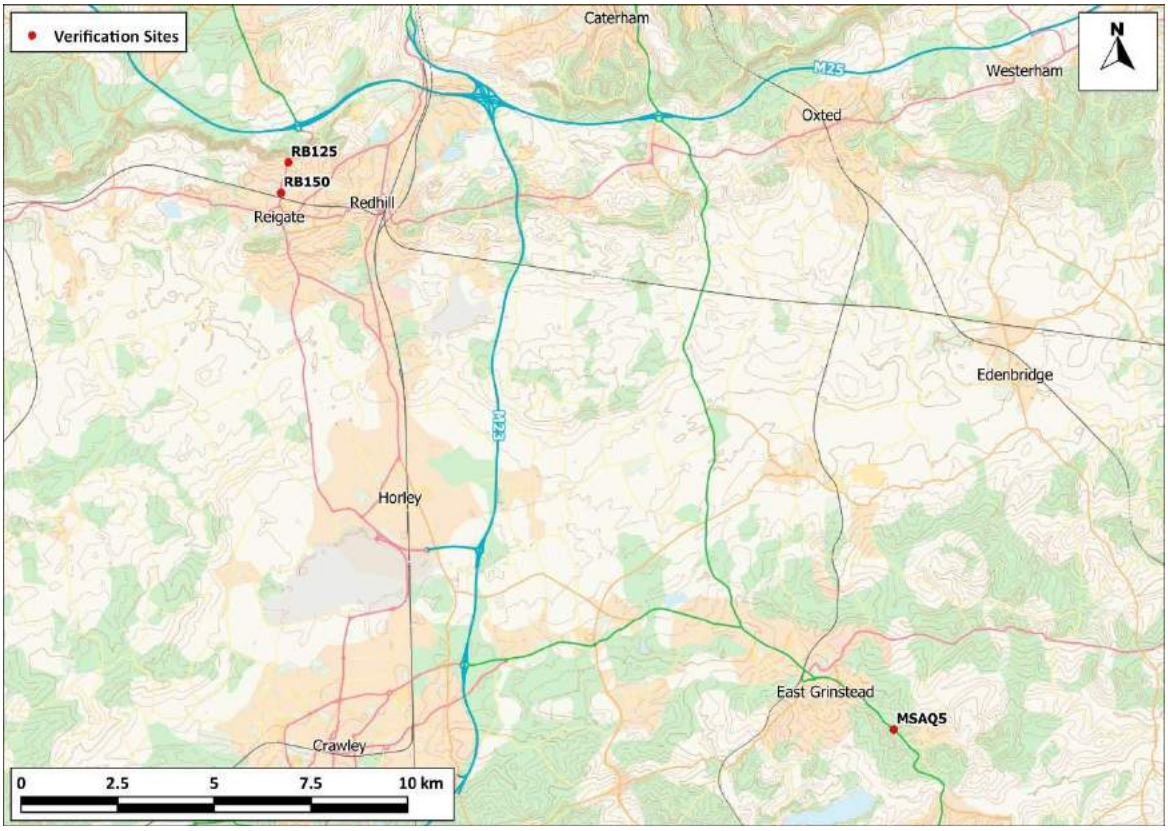

Figure 4: Local Monitoring Sites used in Model Verification

3.31 The ammonia emissions obtained from the CREAM tool and input into the dispersion model have been pre-verified against the best available roadside ammonia measurements and therefore do not

6 Defra, 2018, Local Air Quality Management Review and Assessment, Technical Guidance (TG(16)).

require any post-model adjustment. The ammonia outputs from the model have therefore been left unadjusted.

NOx to NO_2 Conversion

3.32 In order to calculate nutrient nitrogen deposition, it is necessary to convert modelled road-NOx to NO_2. This has been done using the latest version of Defra's NOx to NO_2 calculator (v8.1)[7]. The vehicle fleet mix within the calculator has been set to 'All Non-urban UK Traffic'. This is consistent with the fleet mix setting used in the EFT as discussed in Paragraph 3.20.

3.33 The latest version of Defra's NOx to NO_2 calculator does not allow calculations for 2015 (as it does not have primary NO_2 data for this year), therefore NOx to NO_2 conversion for the 2015 baseline model has been undertaken using Defra's NOx to NO_2 calculator Version 6.1[8].

Deposition Rates

3.34 Deposition of NO_2 has been calculated outside of the ADMS-Roads models from the predicted ambient concentrations. This is because NO_2 is calculated from modelled NOx outside of the model (Paragraph 3.32). This method discounts longer-range dry deposition of NO_2, which is conservative, although the relatively slow rate of NO_2 deposition means that the overestimate will be marginal. Deposition of nitric oxide (NO) has not been included because NO deposits so slowly (when it deposits at all) that its contribution even to kerbside deposition fluxes is extremely small.

3.35 For ammonia, deposition has been calculated within the ADMS-Roads model. This approach has been taken for ammonia because it deposits so rapidly that to ignore the depletion of this gas would introduce significant error. Also, ammonia is a primary pollutant that does not require calculation outside of the model, unlike NO_2, which must be calculated based on the model NOx outputs.

3.36 Models for grassland and forest have been run separately for each scenario in order to account for the different habitat types within the ecological sites. Different deposition velocities for ammonia have been used within these models. The annual average deposition velocities used in the modelling are presented in Table 4.

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7 Defra, 2020, NOx to NO_2 Calculator Version 8.1: https://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html

8 Defra, 2020, Local Air Quality Management (LAQM) Support Website: https://laqm.defra.gov.uk/

Table 4: Deposition Velocities

Pollutant	Deposition Velocity (m/s)	Reference
Nitrogen Dioxide	0.003 (Forest)	AQTAG06[9]
	0.0015 (Grassland)	
Ammonia	0.03 (Forest)	
	0.02 (Grassland)	

3.37 Wet deposition has not been included. Wet deposition of the emitted pollutants close to the emission source will be restricted to wash-out, or below cloud scavenging. For this to occur, rain droplets must come into contact with the gas molecules before they hit the ground. Falling raindrops displace the air around them, effectively pushing gases away. The effects of wet deposition will therefore be minimal and have been discounted to provide a worst-case assessment.

Background Concentrations

NOx and NO_2

3.38 The background pollutant concentrations across the study area have been defined using the national pollution maps published by Defra[10]. These cover the whole of the UK on a 1x1 km grid and are published for each year from 2015 until 2030.

3.39 The mapped concentrations for 2015 have been derived from Defra's background maps calibrated to 2015, whilst those for 2030 (to represent 2035) have been derived from Defra's background maps calibrated to 2018. This approach has been taken to align with the use of vehicle emissions factors from Defra's EFT v10.0.

Ammonia

3.40 Background ammonia concentrations have been obtained from mapped concentrations published by CEH on the Air Pollution Information System (APIS) website[11]. The concentrations are 5 km x 5 km grid square averages, based on the three year mean between 2016 and 2018.

3.41 A single value has been used to represent background ammonia concentrations across the site, this value being the grid average across the site, given on the 'Trends' tab of APIS.

3.42 It has been assumed that ammonia backgrounds will not change between 2015 and 2035.

9 AQTAG (2011), 'AQTAG06 - Technical guidance on detailed modelling approach for an appropriate assessment for emissions to air'

10 Defra (2020), Local Air Quality Management (LAQM) Support Website, Available: http://laqm.defra.gov.uk/.

11 www.apis.ac.uk

Nutrient Nitrogen Deposition

3.43 Three-year average (2016-2018 inclusive) background nitrogen deposition fluxes for each 5 km x 5 km grid have been taken from the Concentration Based Estimated Deposition (CBED) model results available on APIS. As for ammonia concentrations, the site grid average concentration has been used, however separate averages have been used to represent short vegetation and forest.

3.44 Future year background have been calculated by assuming a 2% improvement for each year up to 2023, with no improvement beyond 2023, which is consistent with methodology outlined in the Ashdown Forest Statement of Common Ground (SCG)[12].

Acid Nitrogen Deposition

3.45 The acid nitrogen deposition fluxes have been derived from the nutrient nitrogen deposition fluxes, following basic chemical and mathematical rules[13].

12 South Downs Nation Park Authority (2018) Ashdown Forest Statement of Common Ground

13 i.e. 1 kg N/ha/yr = 0.071 keq/ha/yr

4 Modelled Roads

4.1 The following roads sections have been included in the dispersion modelling assessment:

- M25 between Junction 8 and Junction 9;
- B2032 between A25 and A217;
- A24 between A246 and B2038;
- A25 between A24 and B2032;
- A217 between M25 and A25;
- A22 between B2110 (East Grinstead) and A272;
- A275 between A22 and Freshfield Lane; and
- A26 between A272 and B2157.

4.2 The screened-in roads are shown in Figure 5.

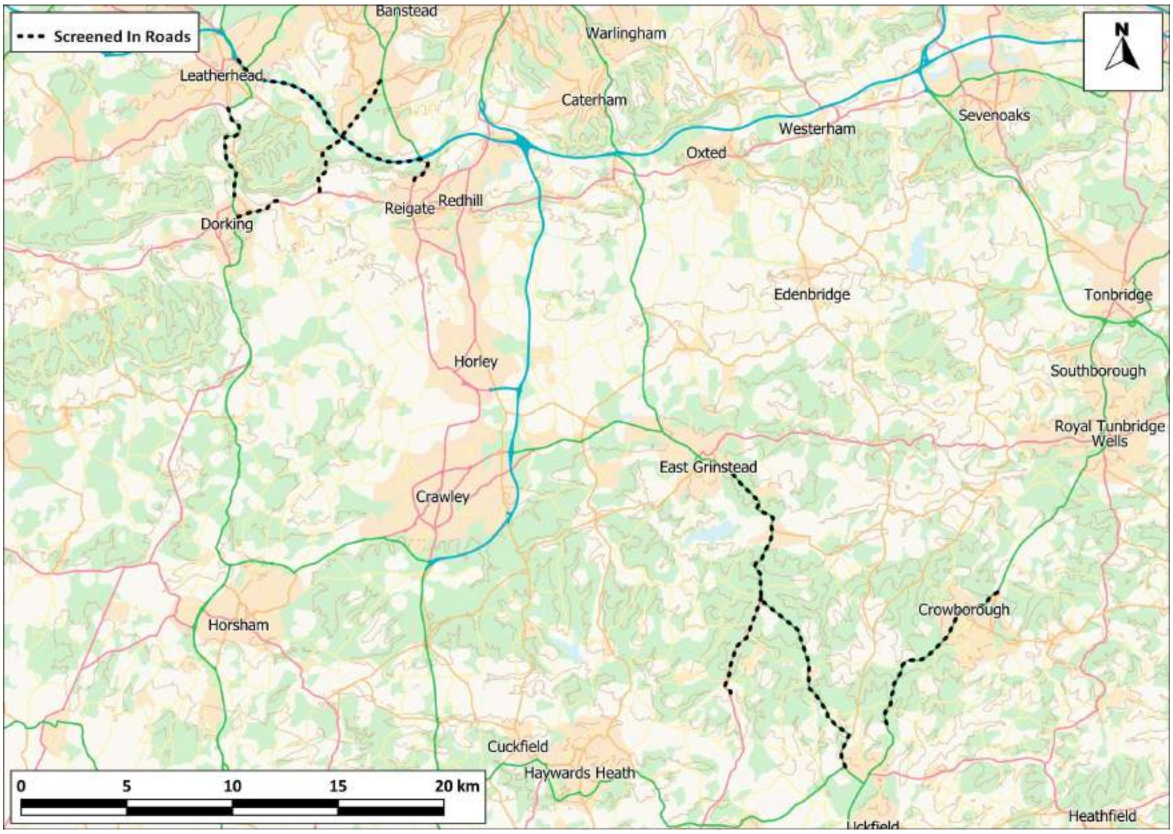

Figure 5: Roads Screened in for Detailed Assessment

5 Dispersion Model Results

Model Verification

5.1 The NOx outputs from the ADMS-Roads dispersion model have been verified against local air quality measurements. The ammonia emissions have been pre-verified, so the post-model verification is limited to NOx.

5.2 The model output of road-NOx (i.e. the component of total NOx coming from road traffic) has been compared with the 'measured' road-NOx. Measured road-NOx has been calculated from the measured NO_2 concentrations and the predicted background NO_2 concentration using the NOx from NO_2 calculator (Version 6.1)[8].

5.3 The unadjusted model has under predicted the road-NOx contribution; this is a common experience with this and most other road traffic emissions dispersion models.

Ashdown Forest

5.4 An adjustment factor of 4.523 has been determined as the ratio of the 'measured' road contribution and the model derived road contribution. This factor has then been applied to the modelled road-NOx concentration for each receptor to provide adjusted modelled road-NOx concentrations. The total nitrogen dioxide concentrations have then been determined by combining the adjusted modelled road-NOx concentrations with the predicted background NO_2 concentration within the NOx to NO_2 calculator (Defra, 2021a).

- The data used to calculate the adjustment factor are provided below:
- Measured NO_2 : 32.8 μg/m^3
- Background NO_2 : 9.9 μg/m^3
- 'Measured' road-NOx (using NOx from NO_2 calculator): 46.3 μg/m^3
- Modelled road-NOx = 10.2 μg/m^3
- Road-NOx adjustment factor: 46.3/10.2 = **4.523**[14]

Mole Gap

5.5 An adjustment factor has been determined as the slope of the best-fit line between the 'measured' road contribution and the model derived road contribution, forced through zero (Figure 6).

5.6 The calculated adjustment factor of 2.107 has been applied to the modelled road-NOx concentration for each Mole Gap receptor to provide adjusted modelled road-NOx concentrations.

14 Based on un-rounded values.

5.7 The total nitrogen dioxide concentrations have then been determined by combining the adjusted modelled road-NOx concentrations with the predicted background NO_2 concentration within the NOx to NO_2 calculator. Figure 7 compares final adjusted modelled total NO_2 at each of the monitoring sites to measured total NO_2.

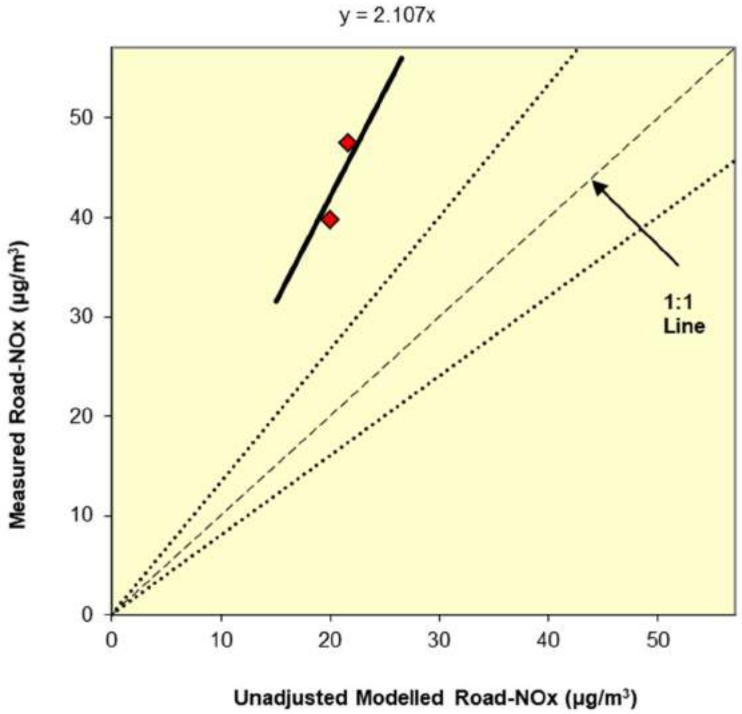

Figure 6: Comparison of Measured Road NOx to Unadjusted Modelled Road NOx Concentrations. The dashed lines show ± 25%.

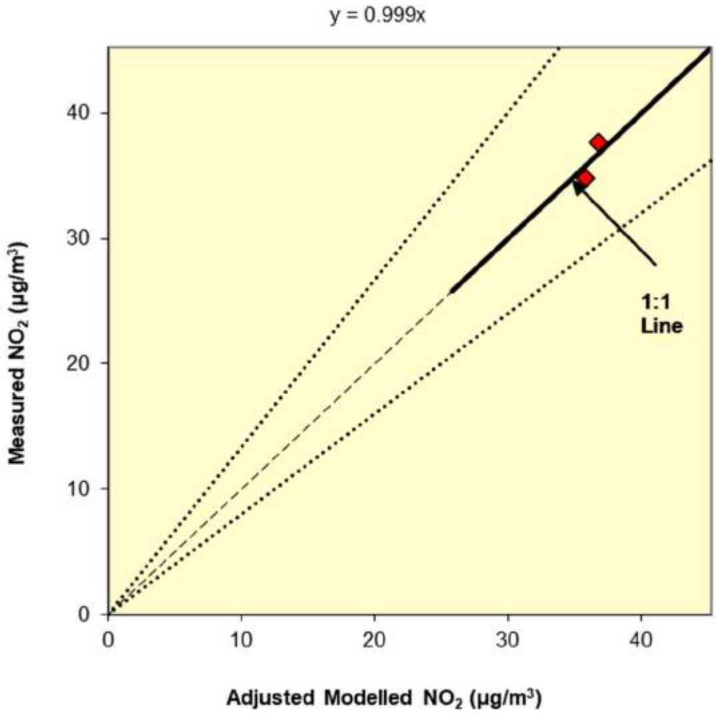

Figure 7: Comparison of Measured Total NO_2 to Final Adjusted Modelled Total NO_2 Concentrations. The dashed lines show ± 25%.

Receptor Transects

5.8 Transects of receptors have been selected for inclusion in the modelling, extending into the designated sites from the edge of each of the modelled roads.

5.9 The receptor transects have been defined as described in Paragraph 3.6. For roads which are a simple straight-line link, a single receptor transect has been used to assess the pollutant concentrations and deposition fluxes along the whole road section. For roads where there is either a significant bend in the road or where there are designated habitats on both sides of the roads, then multiple transects have been modelled. Multiple transects on roads with bends and with designated habitats on both sides of the road are to capture the variation in pollutant concentrations and deposition fluxes causes by road orientation with respect to prevailing winds.

5.10 The receptor transects used in the assessment are presented Appendix A1.

Model Results

5.11 The model results for all pollutants at the screened in roads are presented in tables in Appendix A2 (Ashdown Forest) and Appendix A3 (Mole Gap).

NOx

5.12 NOx concentrations are seen to show an overall reduction between the 2015 baseline and all future scenarios within all receptor transects.

Ashdown Forest

5.13 The in-isolation contributions to NOx concentrations are largely below 1% of the critical level in 2035, with the exception of seven receptors in the A275 transect and six receptors in the A22/A275 Junction transect. These receptors are immediately adjacent to the road edge, with the furthest exceedance being 7 m from the road edge. The maximum in isolation contribution is 1.6% of the critical level. Full NOx results for Ashdown Forest transects can be seen in Table A2.1.

5.14 The in-combination contributions to NOx concentrations exceed 1% of the critical level at all receptors along the A26 at all transects (see Figure A1.4), the A22 at West Wood, Milbrook Farm and Little Birch Wood (see Figure A1.3) and the A275 including both transects at the A22/A275 junction and the A22/A275 junction south (see Figure A1.2) in 2035. However, the NOx concentrations show a reduction compared to the 2015 baseline at most receptors except for at the immediate roadside for A26 Poplar Farm and up to 10 m from Poundgate and Owl House. It should be noted that for most receptors in the future NO_x is below the critical level of 30 µg/m^3.

Mole Gap

5.15 The in-isolation contributions to NOx concentrations are largely below 1% of the critical level in 2035, with the exception of several receptors along both of the A217 transects (see Figure A1.5). These receptors are within 10 m of the road edge. The maximum in isolation contribution is 2.0% of the critical level at the immediate road edge of the A217. Full NOx results for Mole Gap transects can be seen in Table A3.1 in Appendix A3.

5.16 The in-combination contributions to NOx concentrations exceed 1% of the critical level at several receptors within all transects. However, the NOx concentrations show a reduction compared to the 2015 baseline at all reaches. It should be noted that for all receptors in the future NO_x is below the critical level of 30 µg/m^3 for both the in-isolation and in-combination scenarios.

Ammonia

Ashdown Forest

5.17 The in-isolation contributions to ammonia concentrations are largely below 1% of the critical level, in 2035, with the exception of several receptors adjacent to the A26 at Owl House (see Figure A1.4), A22 at West Wood, Milbrook Farm and Little Birch Wood (see Figure A1.3), the A275 junction with the A22 and the A275 transect (see Figure A1.2). These receptors are within 15 m of the road edge. The maximum in isolation contribution is 2.44% of the critical level. Full ammonia results for Ashdown Forest transects can be seen in Table A2.2.

5.18 The in-combination contributions to ammonia concentrations exceed 1% of the critical level at most receptors in 2035 with the exception of all receptors in the Kidbrooke Wood, stone Quarry House and Hindleap Warren transects. However, in several areas the ammonia concentrations show a reduction compared to the 2015 baseline at all reaches.

5.19 The critical level is predicted not to be met within the Ashdown Forest SAC (where the critical level of 1 μg/m^3 for lichens and bryophytes applies). Exceedances of the critical level are seen for all receptor transects, with exceedances being seen up to 100 m from the road edge in a lot of cases.

Mole Gap

5.20 The in-isolation contributions to ammonia concentrations are largely below 1% of the critical level, in 2035, with the exception of several receptors adjacent to the A217 at Fox Lane and Fort lodge (see Figure A1.5). These receptors are within 30 m of the road edge. The maximum in isolation contribution is 7.4% of the critical level. Full ammonia results for Mole Gap transects can be seen in Table A3.2.

5.21 The in-combination contributions to ammonia concentrations exceed 1% of the critical level at most receptors in 2035.

5.22 The critical level is predicted not to be met within the Mole Gap SAC (where the critical level of 1 μg/m^3 for lichens and bryophytes applies). Exceedances of the critical level are seen for all receptor transects, with exceedances being seen up to 150 m from the road edge in a lot of cases.

Nitrogen Deposition

Ashdown Forest

5.23 Nitrogen deposition fluxes are above the critical load (10 kgN/ha/yr) across all reaches in 2015 and continue to remain above the critical load across all reaches in all scenarios in 2035.

5.24 There are, however, reductions in nitrogen deposition fluxes between the 2015 baseline and all future scenarios across all reaches with the following exceptions:

- Small increases in nitrogen deposition fluxes when comparing 2015 to 2035 Do Minimum and Do Something scenarios up to 5 m from the A275 (see Figure A1.2); and
- increases in nitrogen deposition fluxes when comparing 2015 to 2035 Do Minimum and Do Something scenarios up to 15 m from the A26 at Owl House and Poundgate (see Figure A1.4).

5.25 The in-isolation contributions to nitrogen deposition fluxes are mostly below 1% of the critical load, in 2035, with the exception of several receptors in the A22 transect at Little Birch Wood (see Figure A1.3), the A22/A275 junction transect, the A275 transect (see Figure A1.2) and the A26 at Owl House (see Figure A1.4). These receptors are within 25 m of the road edge. The maximum in isolation contribution is 2.5% of the critical level at the road edge. Full nitrogen deposition results for Ashdown Forest transects can be seen in Table A2.3.

5.26 The in-combination contributions to nitrogen deposition fluxes exceed 1% of the critical level at the majority of receptors in 2035, with the exception of all receptors in the Kidbrooke Wood, Stone Quarry House and Hindleap Warren transects. As discussed in Paragraph 5.24 there are overall reductions in nitrogen deposition between the 2015 baseline and all future scenarios at all but for two locations.

Mole Gap

5.27 Nitrogen deposition fluxes are above the critical load (10 kgN/ha/yr) across all reaches in 2015 and continue to remain above the critical load across all reaches in all scenarios in 2035.

5.28 There are, however, reductions in nitrogen deposition fluxes between the 2015 baseline and all future scenarios across all reaches with the exception of small increases in nitrogen deposition fluxes when comparing 2015 to 2035 Do Minimum and Do Something scenarios up to 4 m from the A217 at both Fox Lane and Fort Lodge (see Figure A1.5).

5.29 The in-isolation contributions to nitrogen deposition fluxes are mostly below 1% of the critical load, in 2035, with the exception of several receptors in the A217 at Fox Lane and Fort Lodge transects. These receptors are within 30 m of the road edge. The maximum in isolation contribution is 6.9% of the critical level. Full nitrogen deposition results for Mole Gap transects can be seen in Table A3.3.

5.30 The in-combination contributions to nitrogen deposition fluxes exceed 1% of the critical level at the majority of receptors in 2035, but as discussed in Paragraph 5.28 there are overall reductions in nitrogen deposition between the 2015 baseline and all future scenarios at all but for two locations.

Acid Deposition

Ashdown Forest

5.31 Acid deposition fluxes are above the relevant critical loads across parts of all reaches in 2015 and continue to remain above the critical loads across all reaches in all scenarios in 2035.

5.32 There are, however, reductions in acid deposition fluxes between the 2015 baseline and all future scenarios across all reaches with the following exceptions:

- Small increases in acid deposition fluxes when comparing 2015 to 2035 Do Minimum and Do Something scenarios up to 2 m from the A275; and
- Small increases in acid deposition fluxes when comparing 2015 to 2035 Do Minimum and Do Something scenarios up to 15 m from the A26 at Owl House and Poundgate.

5.33 The in-isolation contributions to acid deposition fluxes are mostly below 1% of the critical load, in 2035, with the exception of several receptors in the A275, the A22/A275 Junction and the A22 at Little Birch Wood. These receptors are within 7 m of the road edge. The maximum in isolation contribution is 1.9% of the critical level. Full acid deposition results for Ashdown Forest transects can be seen in Table A2.4.

5.34 The in-combination contributions to acid deposition fluxes exceed 1% of the critical level at the majority of receptors in 2035, but as discussed in Paragraph 5.32 there are overall reductions in acid deposition between the 2015 baseline and all future scenarios at all but for two locations.

Mole Gap

5.35 Acid deposition fluxes are above the relevant critical loads across parts of all reaches in 2015 and continue to remain above the critical loads across most receptor transects in all scenarios in 2035, with the exception of both transects on the B2032.

5.36 There are, however, reductions in acid deposition fluxes between the 2015 baseline and all future scenarios across all reaches with the exception of small increases in acid deposition fluxes when comparing 2015 to 2035 Do Minimum and Do Something scenarios up to 5 m from the A217 at Fox Lane and Fort Lodge.

5.37 The in-isolation contributions to acid deposition fluxes are mostly below 1% of the critical load, in 2035, with the exception of several receptors in the A217 transects at Fox Lane and Fort Lodge. These receptors are within 15 m of the road edge. The maximum in isolation contribution is 3.4% of the critical level. Full acid deposition results for Ashdown Forest transects can be seen in Table A3.4.

5.38 The in-combination contributions to acid deposition fluxes exceed 1% of the critical level at the majority of receptors in 2035, but as discussed in Paragraph 5.36 there are overall reductions in acid deposition between the 2015 baseline and all future scenarios at all but for two locations.

6 Appendices

A1 Receptor Transects 24
A2 Ashdown Forest Full Model Results 31
A3 Mole Gap Full Model Results 83

A1 Receptor Transects

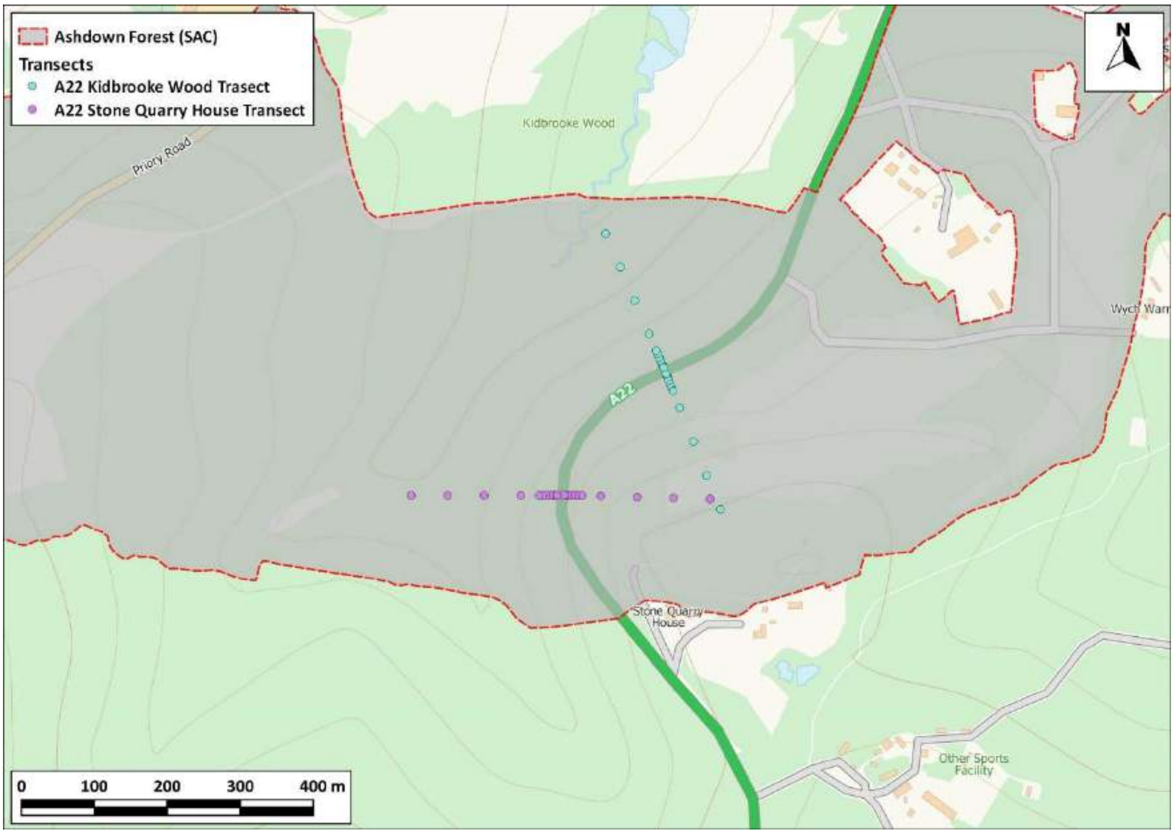

Figure A1.1: A22 (North Section) Receptor Transects

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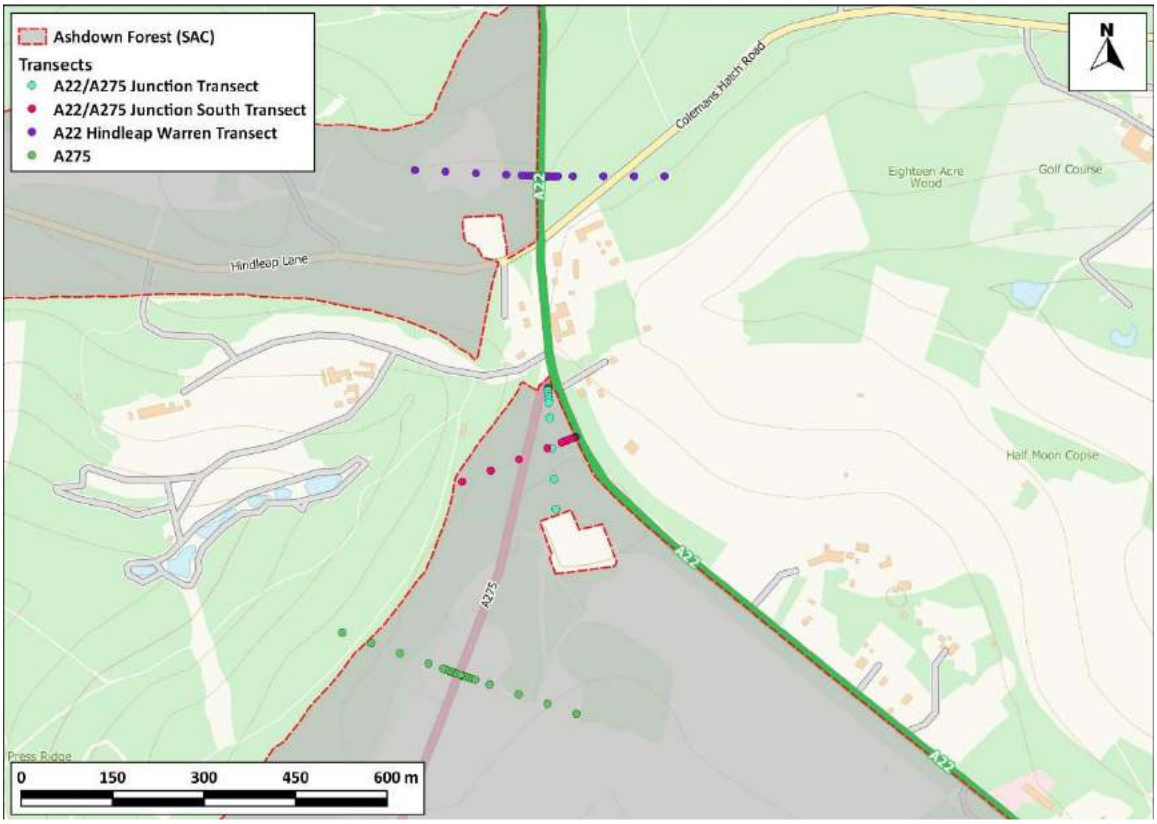

Figure A1.2: A22/A275 Junction Receptor Transects

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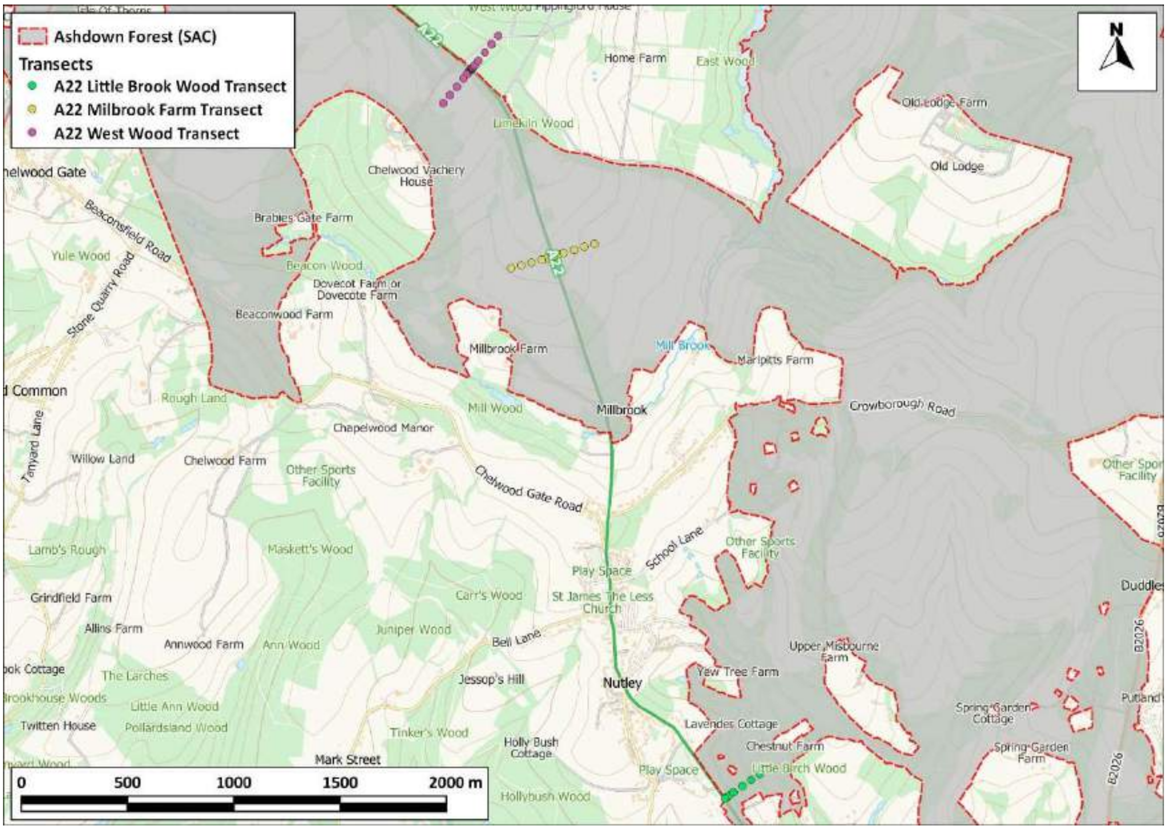

Figure A1.3: A22 (South Section) Receptor Transects

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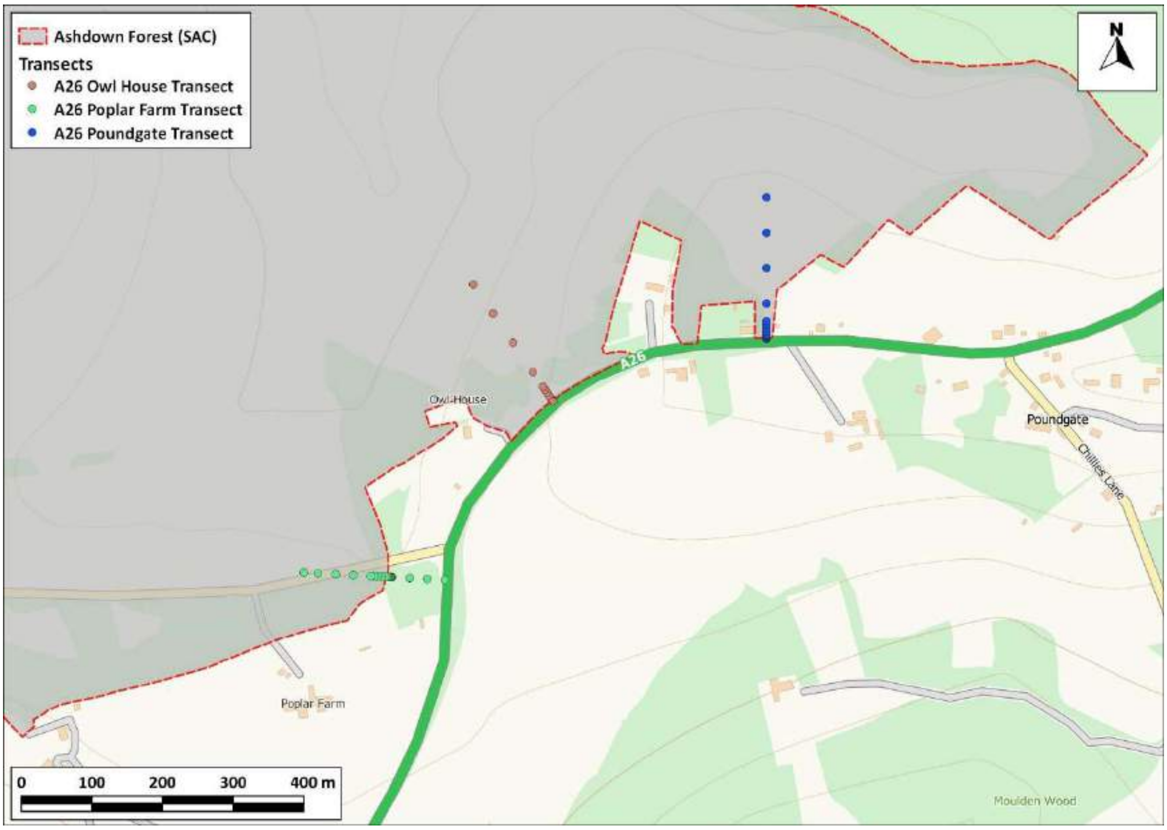

Figure A1.4: A26 Receptor Transects

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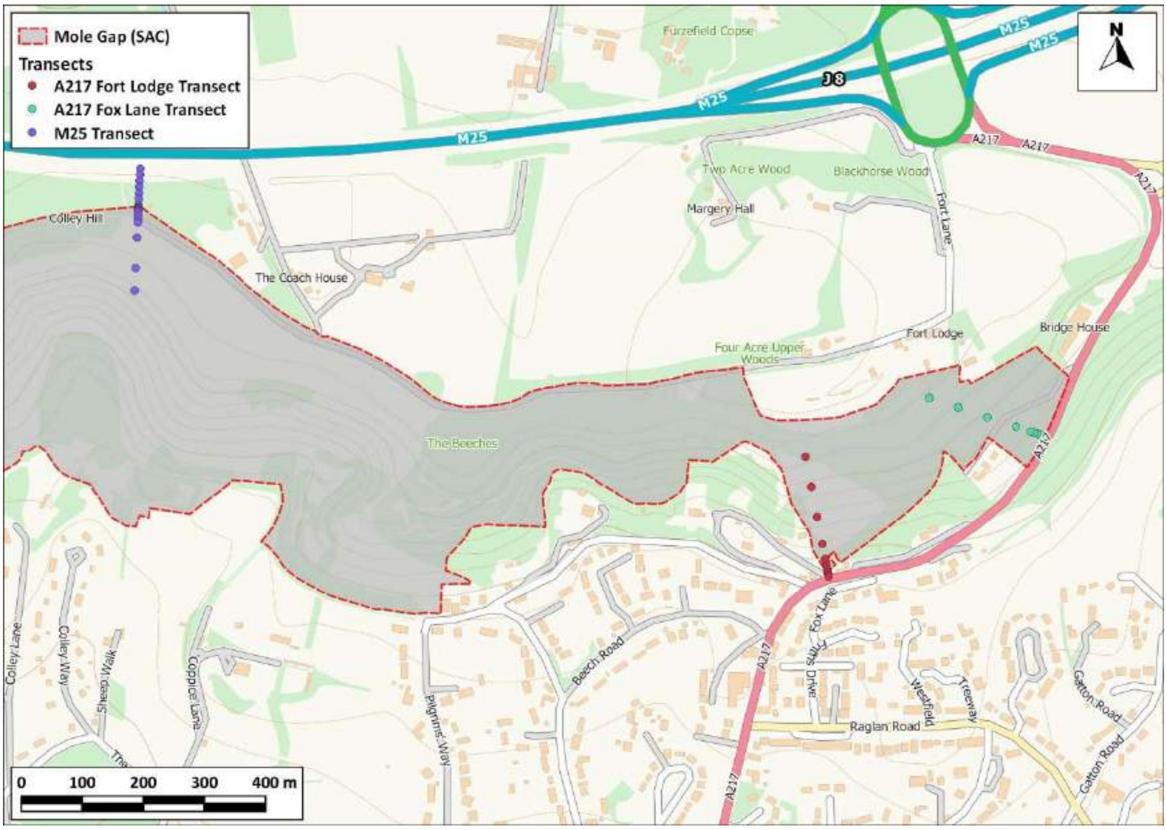

Figure A1.5: M25/A217 Receptor Transects

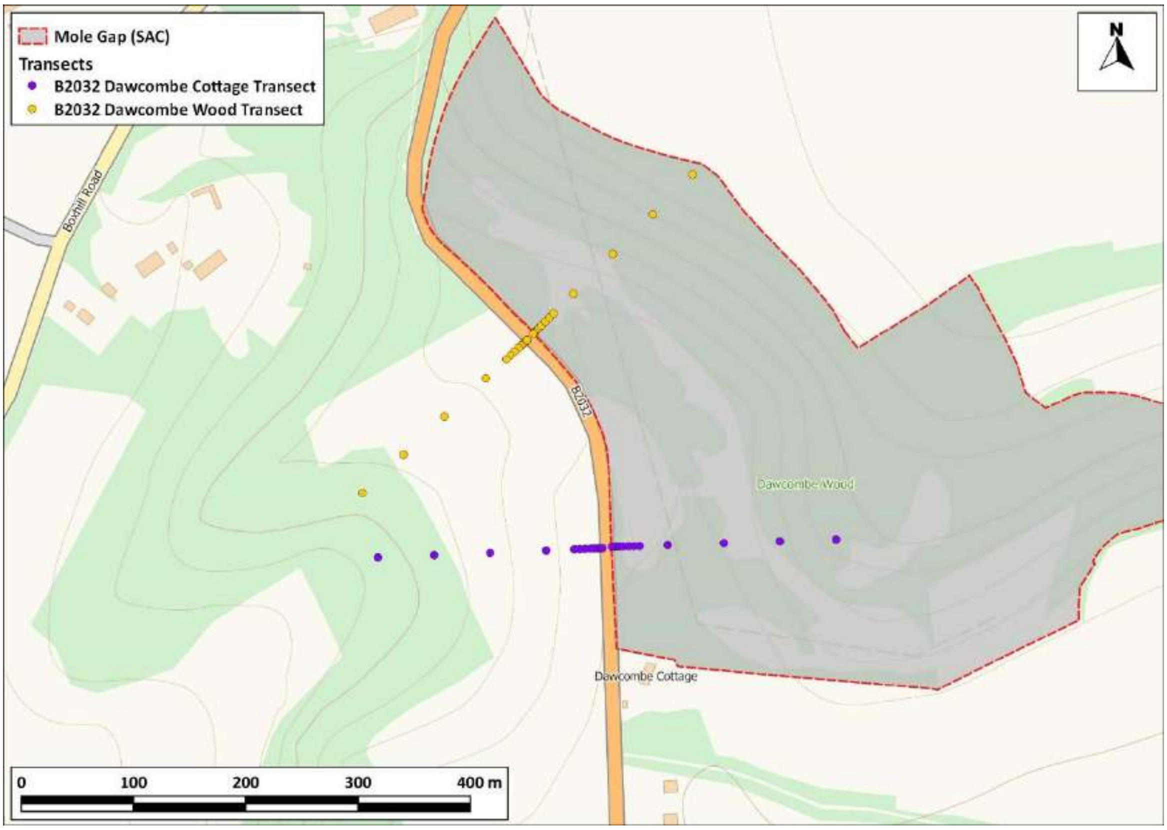

Figure A1.6: B2032 Receptor Transects

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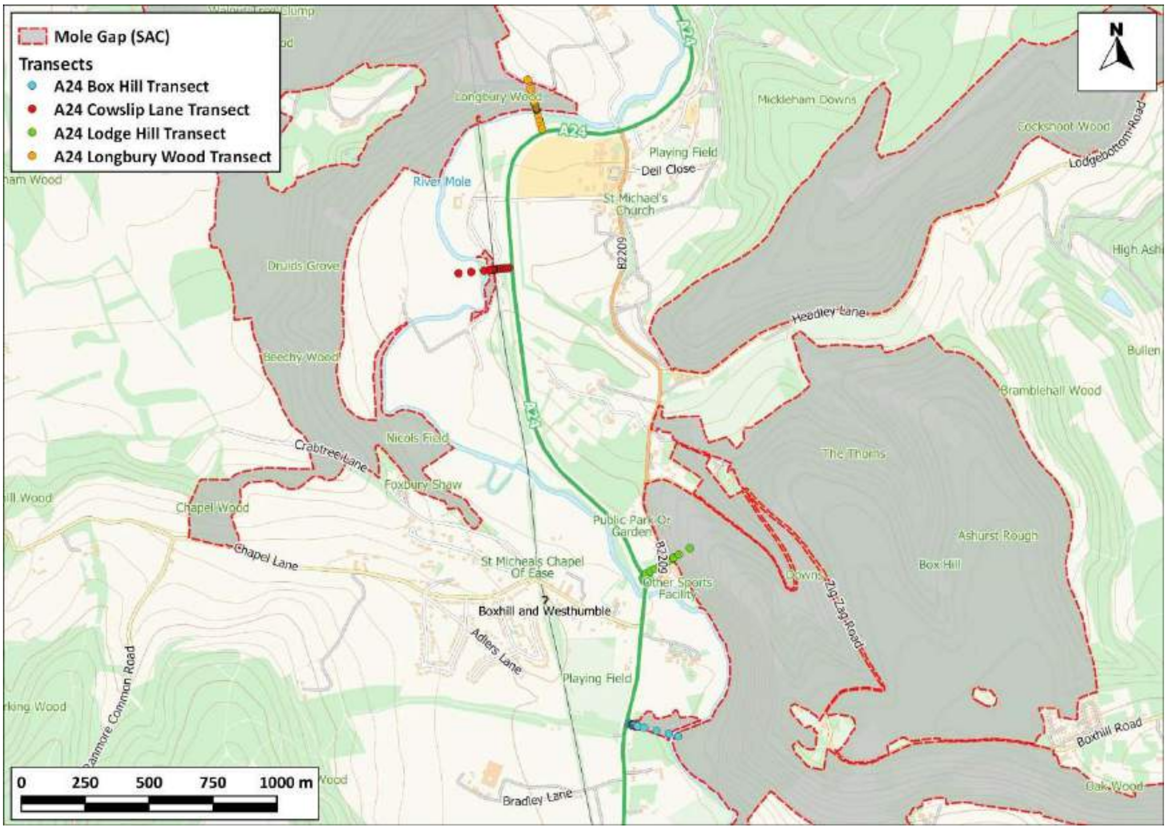

Figure A1.7: A24 Receptor Transects

A2 Ashdown Forest Full Model Results

NOx

Table A2.1: Model Results for NOx

Distance from Road Edge (m)		Side of Road	Total Concentration (µg/m³)				% Change Relative of Critical Level [a]	
			2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
A22 (North Section) Receptor Transects								
Kidbrooke Wood Transect	0	North	108.4	31.4	24.4	24.1	-0.8	-24.1
	1	North	92.7	27.5	21.7	21.5	-0.7	-20.2
	2	North	83.5	25.3	20.1	19.9	-0.6	-17.9
	3	North	76.6	23.6	18.9	18.7	-0.5	-16.2
	4	North	71.4	22.3	18.0	17.9	-0.5	-14.8
	5	North	67.2	21.3	17.3	17.1	-0.5	-13.8
	7	North	60.1	19.5	16.1	15.9	-0.4	-12.0
	10	North	52.7	17.7	14.8	14.7	-0.3	-10.1
	15	North	44.6	15.7	13.4	13.3	-0.3	-8.1
	20	North	39.3	14.5	12.5	12.4	-0.2	-6.8
	25	North	35.4	13.5	11.8	11.8	-0.2	-5.8
	50	North	25.3	11.1	10.1	10.1	-0.1	-3.3
	100	North	18.5	9.4	9.0	9.0	-0.1	-1.6
	150	North	16.0	8.9	8.6	8.6	0.0	-1.0
	200	North	14.8	8.6	8.4	8.4	0.0	-0.7
	0	South	90.3	26.3	20.7	20.5	-0.6	-19.2

	Distance from Road Edge (m)	Side of Road	Total Concentration (µg/m^3)				% Change Relative of Critical Level [a]	
			2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
	1	South	73.6	22.3	17.9	17.8	-0.5	-15.0
	2	South	65.3	20.3	16.6	16.4	-0.4	-13.0
	3	South	59.5	19.0	15.6	15.5	-0.4	-11.6
	4	South	55.0	17.9	14.9	14.8	-0.3	-10.5
	5	South	51.6	17.1	14.3	14.2	-0.3	-9.6
	7	South	46.1	15.8	13.4	13.3	-0.3	-8.3
	10	South	40.5	14.5	12.5	12.4	-0.2	-6.9
	15	South	34.4	13.1	11.5	11.5	-0.2	-5.4
	20	South	30.6	12.2	10.9	10.9	-0.1	-4.5
	25	South	27.9	11.6	10.5	10.4	-0.1	-3.9
	50	South	21.4	10.1	9.4	9.4	-0.1	-2.3
	100	South	17.7	9.3	8.9	8.8	0.0	-1.4
	150	South	16.7	9.0	8.7	8.7	0.0	-1.2
	200	South	16.3	9.0	8.6	8.6	0.0	-1.1
Stone Quarry House Transect	0	East	103.6	29.9	23.3	23.1	-0.8	-22.7
	1	East	85.4	25.5	20.2	20.0	-0.6	-18.2
	2	East	76.3	23.3	18.7	18.5	-0.5	-15.9
	3	East	69.9	21.8	17.6	17.5	-0.5	-14.3
	4	East	65.1	20.6	16.8	16.6	-0.4	-13.1
	5	East	61.1	19.6	16.1	16.0	-0.4	-12.1
	7	East	55.0	18.1	15.1	15.0	-0.4	-10.6
	10	East	48.5	16.6	14.0	13.9	-0.3	-9.0
	15	East	41.7	15.0	12.8	12.8	-0.2	-7.3

Distance from Road Edge (m)	Side of Road	Total Concentration (µg/m³)				% Change Relative of Critical Level [a]	
		2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
20	East	37.2	13.9	12.1	12.0	-0.2	-6.2
25	East	33.9	13.1	11.5	11.5	-0.2	-5.4
50	East	25.6	11.1	10.2	10.1	-0.1	-3.4
100	East	20.0	9.8	9.2	9.2	-0.1	-2.0
150	East	17.8	9.3	8.9	8.9	0.0	-1.4
200	East	16.5	9.0	8.7	8.7	0.0	-1.1
0	West	69.6	21.3	17.3	17.1	-0.5	-14.0
1	West	57.8	18.6	15.3	15.2	-0.4	-11.1
2	West	51.5	17.1	14.3	14.2	-0.3	-9.6
3	West	47.2	16.1	13.6	13.5	-0.3	-8.5
4	West	43.8	15.3	13.1	13.0	-0.3	-7.7
5	West	41.1	14.7	12.6	12.6	-0.2	-7.1
7	West	37.1	13.7	12.0	11.9	-0.2	-6.1
10	West	33.0	12.8	11.3	11.3	-0.2	-5.1
15	West	28.5	11.8	10.6	10.6	-0.1	-4.0
20	West	25.8	11.1	10.1	10.1	-0.1	-3.4
25	West	23.8	10.7	9.8	9.8	-0.1	-2.9
50	West	18.9	9.6	9.1	9.0	-0.1	-1.7
100	West	15.8	8.8	8.5	8.5	0.0	-1.0
150	West	14.5	8.5	8.3	8.3	0.0	-0.7
200	West	13.8	8.4	8.2	8.2	0.0	-0.5

	Distance from Road Edge (m)	Side of Road	Total Concentration (µg/m³)				% Change Relative of Critical Level [a]	
			2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
A22/A275 Junction Receptor Transects								
Hindleap Warren Transect	0	East	100.7	29.2	23.0	22.8	-0.7	-21.4
	1	East	86.6	25.8	20.6	20.4	-0.6	-17.9
	2	East	78.2	23.8	19.2	19.0	-0.5	-15.8
	3	East	72.0	22.3	18.1	18.0	-0.5	-14.3
	4	East	67.2	21.1	17.3	17.2	-0.4	-13.1
	5	East	63.2	20.1	16.6	16.5	-0.4	-12.1
	7	East	57.0	18.6	15.6	15.5	-0.4	-10.5
	10	East	50.2	17.0	14.4	14.3	-0.3	-8.8
	15	East	42.8	15.2	13.2	13.1	-0.2	-6.9
	20	East	37.9	14.0	12.4	12.3	-0.2	-5.7
	25	East	34.4	13.2	11.8	11.7	-0.2	-4.8
	50	East	24.6	10.7	10.0	10.0	-0.1	-2.5
	100	East	18.7	9.3	9.1	9.1	0.0	-0.9
	150	East	16.5	8.8	8.7	8.7	0.0	-0.3
	200	East	15.4	8.6	8.6	8.6	0.0	0.0
	0	West	73.9	22.3	18.1	18.0	-0.5	-14.4
	1	West	62.3	19.6	16.2	16.1	-0.4	-11.6
	2	West	56.0	18.1	15.2	15.1	-0.3	-10.1
	3	West	51.6	17.1	14.5	14.4	-0.3	-9.0
	4	West	48.1	16.3	13.9	13.8	-0.3	-8.2
	5	West	45.3	15.6	13.4	13.4	-0.2	-7.5
	7	West	41.1	14.6	12.8	12.7	-0.2	-6.5

Distance from Road Edge (m)		Side of Road	Total Concentration (µg/m³)				% Change Relative of Critical Level [a]	
			2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
	10	West	36.4	13.5	12.0	11.9	-0.2	-5.3
	15	West	31.3	12.4	11.2	11.1	-0.1	-4.1
	20	West	28.0	11.6	10.6	10.6	-0.1	-3.3
	25	West	25.7	11.1	10.3	10.2	-0.1	-2.8
	50	West	19.8	9.7	9.3	9.3	0.0	-1.4
	100	West	15.9	8.8	8.6	8.6	0.0	-0.6
	150	West	14.5	8.5	8.4	8.4	0.0	-0.3
	200	West	13.8	8.3	8.2	8.2	0.0	-0.2
A22/A275 Junction Transect	1	South	88.6	26.4	39.6	40.0	1.5	45.3
	2	South	81.6	24.7	36.1	36.5	1.3	39.4
	3	South	77.0	23.6	33.9	34.3	1.2	35.7
	4	South	73.6	22.8	32.3	32.6	1.1	33.0
	5	South	71.0	22.1	31.1	31.4	1.0	30.9
	7	South	68.8	21.6	30.1	30.4	1.0	29.2
	10	South	61.4	19.8	26.7	27.0	0.8	23.9
	15	South	57.1	18.8	24.9	25.1	0.7	21.1
	20	South	54.0	18.0	23.6	23.8	0.7	19.4
	25	South	51.5	17.4	22.6	22.8	0.6	18.1
	50	South	42.1	15.1	19.2	19.3	0.5	13.9
	100	South	32.0	12.7	15.5	15.6	0.3	9.7
	150	South	26.5	11.4	13.5	13.6	0.3	7.4
	200	South	22.8	10.5	12.2	12.3	0.2	5.9

Distance from Road Edge (m)		Side of Road	Total Concentration (µg/m^3)				% Change Relative of Critical Level [a]	
			2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
A22/A275 South Junction Transect	0	West	85.0	24.8	27.8	27.9	0.6	10.4
	1	West	73.0	22.1	24.7	24.9	0.5	9.4
	2	West	66.9	20.7	23.2	23.3	0.5	9.0
	3	West	62.5	19.6	22.1	22.2	0.5	8.7
	4	West	59.0	18.8	21.2	21.3	0.4	8.4
	5	West	56.2	18.2	20.5	20.6	0.4	8.3
	7	West	51.7	17.1	19.4	19.5	0.4	8.0
	10	West	46.9	16.0	18.2	18.3	0.4	7.8
	15	West	41.5	14.8	17.0	17.1	0.3	7.7
	20	West	37.7	14.0	16.2	16.3	0.3	7.8
	25	West	35.4	13.4	15.8	15.8	0.3	8.0
	50	West	32.7	12.9	16.2	16.3	0.4	11.3
	100	West	34.1	13.3	18.0	18.1	0.5	16.2
	150	West	19.5	9.7	11.0	11.1	0.2	4.6
	200	West	16.5	8.9	9.7	9.7	0.1	2.7

	Distance from Road Edge (m)	Side of Road	Total Concentration (µg/m³)				% Change Relative of Critical Level [a]	
			2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
A275 Transect	0	West	63.6	20.9	34.3	34.7	1.4	46.0
	1	West	53.5	18.3	29.0	29.3	1.1	36.9
	2	West	48.1	16.9	26.3	26.5	1.0	32.1
	3	West	44.4	16.0	24.3	24.6	0.9	28.7
	4	West	41.4	15.2	22.8	23.0	0.8	26.1
	5	West	39.1	14.6	21.6	21.8	0.7	24.0
	7	West	35.4	13.7	19.7	19.9	0.6	20.7
	10	West	31.5	12.7	17.7	17.9	0.5	17.2
	15	West	27.3	11.6	15.6	15.7	0.4	13.5
	20	West	24.5	11.0	14.2	14.3	0.3	11.0
	25	West	22.6	10.5	13.2	13.3	0.3	9.3
	50	West	17.9	9.3	10.8	10.9	0.2	5.2
	100	West	15.0	8.6	9.3	9.4	0.1	2.6
	150	West	13.9	8.3	8.8	8.8	0.1	1.7
	200	West	13.4	8.2	8.5	8.6	0.0	1.3
	0	East	72.7	23.4	39.2	39.6	1.6	54.2
	1	East	61.3	20.5	33.2	33.6	1.3	43.9
	2	East	55.2	18.9	30.0	30.4	1.1	38.4
	3	East	50.6	17.7	27.6	27.9	1.0	34.3
	4	East	47.2	16.8	25.9	26.2	0.9	31.3
	5	East	44.5	16.1	24.5	24.7	0.9	28.8
	7	East	40.3	15.0	22.3	22.5	0.7	25.1
	10	East	35.7	13.8	19.9	20.1	0.6	21.0

	Distance from Road Edge (m)	Side of Road	Total Concentration (µg/m^3)				% Change Relative of Critical Level [a]	
			2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
	15	East	30.8	12.6	17.4	17.5	0.5	16.6
	20	East	27.6	11.8	15.7	15.9	0.4	13.7
	25	East	25.4	11.2	14.6	14.7	0.4	11.7
	50	East	19.8	9.8	11.7	11.8	0.2	6.7
	100	East	16.3	8.9	9.9	10.0	0.1	3.5
	150	East	15.1	8.6	9.3	9.3	0.1	2.4
	200	East	15.0	8.5	9.0	9.0	0.1	1.8
A22 (South Section) Receptor Transects								
West Wood Transect	0	West	80.5	23.6	25.0	25.2	0.5	5.3
	1	West	70.9	21.4	22.6	22.7	0.4	4.6
	2	West	64.5	19.9	21.0	21.1	0.4	4.1
	3	West	59.6	18.7	19.7	19.8	0.3	3.7
	4	West	55.9	17.9	18.8	18.9	0.3	3.5
	5	West	52.8	17.1	18.0	18.1	0.3	3.2
	7	West	47.8	16.0	16.7	16.8	0.3	2.8
	10	West	42.4	14.7	15.4	15.4	0.2	2.4
	15	West	36.4	13.3	13.8	13.9	0.2	2.0
	20	West	32.3	12.4	12.8	12.8	0.2	1.7
	25	West	29.4	11.7	12.1	12.1	0.1	1.4
	50	West	22.0	10.0	10.2	10.2	0.1	0.9
	100	West	17.0	8.8	9.0	9.0	0.0	0.5
	150	West	15.2	8.4	8.5	8.5	0.0	0.4
	200	West	14.2	8.2	8.2	8.2	0.0	0.3

	Distance from Road Edge (m)	Side of Road	Total Concentration (µg/m³)				% Change Relative of Critical Level [a]	
			2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
	0	East	119.3	32.8	35.0	35.3	0.8	8.3
	1	East	106.1	29.7	31.7	31.9	0.7	7.3
	2	East	96.9	27.6	29.4	29.5	0.6	6.6
	3	East	89.8	25.9	27.6	27.7	0.6	6.0
	4	East	84.1	24.6	26.1	26.3	0.5	5.6
	5	East	79.3	23.4	24.9	25.0	0.5	5.2
	7	East	71.7	21.6	22.9	23.0	0.4	4.7
	10	East	63.2	19.6	20.7	20.8	0.4	4.0
	15	East	53.5	17.4	18.3	18.3	0.3	3.3
	20	East	47.0	15.8	16.6	16.7	0.3	2.8
	25	East	42.3	14.7	15.4	15.5	0.2	2.4
	50	East	30.0	11.8	12.2	12.3	0.1	1.5
	100	East	21.4	9.8	10.1	10.1	0.1	0.8
	150	East	18.2	9.1	9.3	9.3	0.1	0.6
	200	East	16.6	8.7	8.8	8.8	0.0	0.5
Milbrook Farm Transect	0	West	78.0	22.3	23.6	23.7	0.5	4.9
	1	West	70.7	20.7	21.9	22.0	0.4	4.3
	2	West	65.6	19.5	20.6	20.7	0.4	4.0
	3	West	61.8	18.7	19.7	19.8	0.4	3.7
	4	West	58.7	18.0	19.0	19.1	0.3	3.5
	5	West	55.9	17.4	18.3	18.4	0.3	3.3
	10	West	46.4	15.3	16.0	16.1	0.3	2.6
	15	West	40.3	13.9	14.5	14.5	0.2	2.2

Distance from Road Edge (m)	Side of Road	Total Concentration (µg/m³)				% Change Relative of Critical Level [a]	
		2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
20	West	35.9	12.9	13.4	13.4	0.2	1.9
25	West	32.6	12.1	12.6	12.6	0.2	1.6
50	West	23.6	10.1	10.4	10.4	0.1	1.0
100	West	17.5	8.7	8.9	8.9	0.1	0.6
150	West	15.2	8.2	8.3	8.3	0.0	0.4
200	West	14.1	8.0	8.0	8.0	0.0	0.3
0	East	121.8	32.9	35.1	35.3	0.8	8.1
1	East	113.1	30.9	33.0	33.2	0.7	7.5
2	East	105.9	29.3	31.2	31.4	0.7	7.0
3	East	100.4	28.0	29.8	30.0	0.6	6.6
4	East	95.7	26.9	28.6	28.8	0.6	6.2
5	East	91.4	25.9	27.5	27.7	0.6	5.9
10	East	76.1	22.4	23.7	23.8	0.5	4.8
15	East	65.6	19.9	21.0	21.1	0.4	4.0
20	East	57.8	18.1	19.0	19.1	0.3	3.5
25	East	51.9	16.7	17.6	17.6	0.3	3.1
50	East	35.6	12.9	13.4	13.5	0.2	1.9
100	East	24.0	10.1	10.4	10.4	0.1	1.0
150	East	19.7	9.1	9.3	9.3	0.1	0.7
200	East	17.4	8.6	8.7	8.7	0.1	0.6

	Distance from Road Edge (m)	Side of Road	Total Concentration (µg/m³)				% Change Relative of Critical Level [a]	
			2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
Little Birch Wood Transect	0	East	136.3	37.0	40.2	40.5	0.9	11.4
	1	East	122.4	33.8	36.6	36.8	0.8	10.2
	2	East	112.4	31.4	33.9	34.1	0.7	9.2
	3	East	104.6	29.5	31.9	32.1	0.7	8.5
	4	East	98.1	27.9	30.2	30.3	0.6	8.0
	5	East	92.6	26.6	28.7	28.9	0.6	7.5
	10	East	73.3	22.0	23.6	23.7	0.4	5.7
	15	East	61.6	19.2	20.5	20.6	0.4	4.6
	20	East	53.6	17.3	18.4	18.5	0.3	3.9
	25	East	47.7	15.9	16.8	16.9	0.3	3.4
	50	East	33.7	12.8	13.4	13.4	0.2	2.1
	100	East	23.9	10.5	10.8	10.8	0.1	1.2
	150	East	20.3	9.6	9.9	9.9	0.1	0.9
	200	East	18.3	9.1	9.3	9.3	0.0	0.7
A26 Receptor Transects								
Poplar Farm Transect	*0*	*West*	*23.1*	*10.0*	*24.8*	*24.9*	*0.4*	*49.9*
	25	*West*	*13.8*	*7.8*	*11.6*	*11.6*	*0.1*	*12.8*
	50	*West*	*12.4*	*7.5*	*9.7*	*9.7*	*0.1*	*7.5*
	75	West	11.9	7.4	8.9	8.9	0.0	5.2
	76	West	11.9	7.4	8.9	8.9	0.0	5.2
	77	West	11.9	7.4	8.9	8.9	0.0	5.1
	78	West	11.8	7.4	8.9	8.9	0.0	5.1
	79	West	11.8	7.4	8.8	8.9	0.0	5.0

Distance from Road Edge (m)		Side of Road	Total Concentration (µg/m³)				% Change Relative of Critical Level [a]	
			2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
	80	West	11.8	7.4	8.8	8.8	0.0	4.9
	82	West	11.8	7.3	8.8	8.8	0.0	4.8
	85	West	11.7	7.3	8.7	8.7	0.0	4.7
	90	West	11.7	7.3	8.6	8.7	0.0	4.4
	95	West	11.6	7.3	8.6	8.6	0.0	4.2
	100	West	11.6	7.3	8.5	8.5	0.0	4.0
	105	West	11.5	7.3	8.4	8.4	0.0	3.8
	130	West	11.4	7.2	8.2	8.2	0.0	3.1
	155	West	11.2	7.2	8.0	8.0	0.0	2.6
	180	West	11.1	7.2	7.9	7.9	0.0	2.3
	200	West	11.1	7.2	7.8	7.8	0.0	2.0
Owl House Transect	0	Northwest	29.8	11.6	34.2	34.4	0.6	75.9
	1	Northwest	27.1	11.0	30.4	30.6	0.5	65.3
	2	Northwest	25.4	10.6	28.0	28.2	0.5	58.7
	3	Northwest	24.1	10.3	26.2	26.3	0.4	53.6
	4	Northwest	23.1	10.0	24.7	24.9	0.4	49.5
	5	Northwest	22.2	9.8	23.5	23.6	0.4	46.0
	10	Northwest	19.2	9.1	19.3	19.4	0.3	34.3
	15	Northwest	17.4	8.7	16.8	16.8	0.2	27.2
	20	Northwest	16.2	8.4	15.1	15.1	0.2	22.4
	25	Northwest	15.3	8.2	13.8	13.9	0.2	19.0
	50	Northwest	13.1	7.7	10.7	10.7	0.1	10.3
	100	Northwest	11.8	7.3	8.8	8.8	0.0	4.8

	Distance from Road Edge (m)	Side of Road	Total Concentration (µg/m³)				% Change Relative of Critical Level [a]	
			2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
	150	Northwest	11.3	7.2	8.1	8.1	0.0	2.9
	200	Northwest	11.1	7.2	7.8	7.8	0.0	2.0
Poundgate Transect	0	East	26.5	10.8	29.7	29.8	0.5	63.3
	1	East	24.5	10.4	26.9	27.0	0.5	55.6
	2	East	23.2	10.1	25.1	25.2	0.4	50.5
	3	East	22.3	9.8	23.7	23.8	0.4	46.6
	4	East	21.5	9.7	22.6	22.7	0.4	43.4
	5	East	20.8	9.5	21.6	21.7	0.3	40.7
	7	East	19.7	9.2	20.0	20.1	0.3	36.3
	10	East	18.4	8.9	18.3	18.4	0.3	31.4
	15	East	17.0	8.6	16.2	16.3	0.2	25.6
	20	East	16.0	8.4	14.8	14.9	0.2	21.6
	25	East	15.3	8.2	13.8	13.8	0.2	18.8
	50	East	13.4	7.8	11.1	11.2	0.1	11.3
	100	East	12.2	7.5	9.4	9.4	0.1	6.4
	150	East	11.3	7.3	8.6	8.6	0.0	4.5
	200	East	11.1	7.2	8.3	8.3	0.0	3.5

[a] Critical Level for NOx is 30 µg/m³.

Ammonia

Table A2.2: Model Results for Ammonia

	Distance from Road Edge (m)	Side of Road	Habitat [a]	Total Concentration (µg/m³)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
A22 (North Section) Receptor Transects									
Kidbrooke Wood Transect	0	North	Forest	2.0	2.3	1.9	1.9	-0.5	-39.5
	1	North	Forest	1.8	2.0	1.7	1.7	-0.4	-32.0
	2	North	Forest	1.6	1.9	1.6	1.6	-0.3	-27.6
	3	North	Forest	1.6	1.7	1.5	1.5	-0.3	-24.4
	4	North	Forest	1.5	1.7	1.4	1.4	-0.3	-22.0
	5	North	Forest	1.4	1.6	1.4	1.4	-0.3	-20.1
	7	North	Forest	1.4	1.5	1.3	1.3	-0.2	-17.0
	10	North	Forest	1.3	1.4	1.2	1.2	-0.2	-13.9
	15	North	Forest	1.2	1.3	1.2	1.2	-0.1	-10.5
	20	North	Forest	1.1	1.2	1.1	1.1	-0.1	-8.5
	25	North	Forest	1.1	1.1	1.1	1.1	-0.1	-7.0
	50	North	Forest	1.0	1.0	1.0	1.0	0.0	-3.6
	100	North	Forest	0.9	1.0	0.9	0.9	0.0	-1.5
	150	North	Forest	0.9	0.9	0.9	0.9	0.0	-0.9
	200	North	Forest	0.9	0.9	0.9	0.9	0.0	-0.6
	0	South	Forest	1.8	2.0	1.7	1.7	-0.4	-31.5
	1	South	Forest	1.6	1.7	1.5	1.5	-0.3	-23.7
	2	South	Forest	1.5	1.6	1.4	1.4	-0.3	-20.0
	3	South	Forest	1.4	1.5	1.3	1.3	-0.2	-17.5

Transect	Distance from Road Edge (m)	Side of Road	Habitat [a]	Total Concentration (µg/m³)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
	4	South	Forest	1.3	1.4	1.3	1.3	-0.2	-15.5
	5	South	Forest	1.3	1.4	1.2	1.2	-0.2	-14.1
	7	South	Forest	1.2	1.3	1.2	1.2	-0.2	-11.9
	10	South	Forest	1.2	1.2	1.1	1.1	-0.1	-9.6
	15	South	Forest	1.1	1.1	1.1	1.1	-0.1	-7.3
	20	South	Forest	1.1	1.1	1.0	1.0	-0.1	-5.9
	25	South	Forest	1.0	1.1	1.0	1.0	-0.1	-4.9
	50	South	Forest	1.0	1.0	1.0	1.0	0.0	-2.7
	100	South	Forest	0.9	1.0	0.9	0.9	0.0	-1.5
	150	South	Forest	0.9	0.9	0.9	0.9	0.0	-1.2
	200	South	Forest	0.9	0.9	0.9	0.9	0.0	-1.1
Stone Quarry House Transect	0	East	Forest	1.9	2.2	1.9	1.8	-0.5	-38.7
	1	East	Forest	1.7	1.9	1.6	1.6	-0.4	-30.2
	2	East	Forest	1.6	1.8	1.5	1.5	-0.3	-25.9
	3	East	Forest	1.5	1.7	1.5	1.5	-0.3	-23.0
	4	East	Forest	1.5	1.6	1.4	1.4	-0.3	-20.8
	5	East	Forest	1.4	1.6	1.4	1.4	-0.2	-19.0
	7	East	Forest	1.3	1.5	1.3	1.3	-0.2	-16.2
	10	East	Forest	1.3	1.4	1.2	1.2	-0.2	-13.4
	15	East	Forest	1.2	1.3	1.2	1.2	-0.1	-10.4
	20	East	Forest	1.1	1.2	1.1	1.1	-0.1	-8.6
	25	East	Forest	1.1	1.2	1.1	1.1	-0.1	-7.3
	50	East	Forest	1.0	1.0	1.0	1.0	-0.1	-4.1

Distance from Road Edge (m)		Side of Road	Habitat [a]	Total Concentration (µg/m³)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
	100	East	Forest	1.0	1.0	1.0	1.0	0.0	-2.2
	150	East	Forest	0.9	1.0	0.9	0.9	0.0	-1.5
	200	East	Forest	0.9	0.9	0.9	0.9	0.0	-1.2
	0	West	Forest	1.5	1.7	1.5	1.5	-0.3	-23.5
	1	West	Forest	1.4	1.5	1.3	1.3	-0.2	-18.2
	2	West	Forest	1.3	1.4	1.3	1.3	-0.2	-15.4
	3	West	Forest	1.3	1.4	1.2	1.2	-0.2	-13.5
	4	West	Forest	1.2	1.3	1.2	1.2	-0.2	-12.0
	5	West	Forest	1.2	1.3	1.2	1.2	-0.1	-10.8
	7	West	Forest	1.2	1.2	1.1	1.1	-0.1	-9.1
	10	West	Forest	1.1	1.2	1.1	1.1	-0.1	-7.4
	15	West	Forest	1.1	1.1	1.0	1.0	-0.1	-5.6
	20	West	Forest	1.0	1.1	1.0	1.0	-0.1	-4.5
	25	West	Forest	1.0	1.0	1.0	1.0	0.0	-3.7
	50	West	Forest	1.0	1.0	0.9	0.9	0.0	-1.9
	100	West	Forest	0.9	0.9	0.9	0.9	0.0	-0.9
	150	West	Forest	0.9	0.9	0.9	0.9	0.0	-0.6
	200	West	Forest	0.9	0.9	0.9	0.9	0.0	-0.4

Distance from Road Edge (m)		Side of Road	Habitat [a]	Total Concentration (µg/m³)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
A22/A275 Junction Receptor Transects									
Hindleap Warren Transect	0	East	Forest	1.9	2.2	1.8	1.8	-0.5	-36.8
	1	East	Forest	1.7	1.9	1.6	1.6	-0.4	-29.8
	2	East	Forest	1.6	1.8	1.6	1.5	-0.3	-25.8
	3	East	Forest	1.5	1.7	1.5	1.5	-0.3	-22.9
	4	East	Forest	1.5	1.6	1.4	1.4	-0.3	-20.6
	5	East	Forest	1.4	1.6	1.4	1.4	-0.2	-18.8
	7	East	Forest	1.3	1.5	1.3	1.3	-0.2	-16.0
	10	East	Forest	1.3	1.4	1.2	1.2	-0.2	-13.0
	15	East	Forest	1.2	1.3	1.2	1.2	-0.1	-9.9
	20	East	Forest	1.1	1.2	1.1	1.1	-0.1	-7.9
	25	East	Forest	1.1	1.1	1.1	1.1	-0.1	-6.5
	50	East	Forest	1.0	1.0	1.0	1.0	0.0	-3.2
	100	East	Forest	1.0	1.0	1.0	1.0	0.0	-1.2
	150	East	Forest	0.9	0.9	0.9	0.9	0.0	-0.5
	200	East	Forest	0.9	0.9	0.9	0.9	0.0	-0.1
	0	West	Forest	1.6	1.8	1.5	1.5	-0.3	-24.8
	1	West	Forest	1.4	1.6	1.4	1.4	-0.2	-19.3
	2	West	Forest	1.4	1.5	1.3	1.3	-0.2	-16.5
	3	West	Forest	1.3	1.4	1.3	1.3	-0.2	-14.5
	4	West	Forest	1.3	1.4	1.2	1.2	-0.2	-13.0
	5	West	Forest	1.2	1.3	1.2	1.2	-0.1	-11.7
	7	West	Forest	1.2	1.3	1.2	1.2	-0.1	-9.9

Distance from Road Edge (m)		Side of Road	Habitat [a]	Total Concentration (µg/m³)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
	10	West	Forest	1.1	1.2	1.1	1.1	-0.1	-8.0
	15	West	Forest	1.1	1.1	1.1	1.1	-0.1	-5.9
	20	West	Forest	1.0	1.1	1.0	1.0	-0.1	-4.7
	25	West	Forest	1.0	1.0	1.0	1.0	0.0	-3.8
	50	West	Forest	1.0	1.0	1.0	1.0	0.0	-1.8
	100	West	Forest	0.9	0.9	0.9	0.9	0.0	-0.7
	150	West	Forest	0.9	0.9	0.9	0.9	0.0	-0.4
	200	West	Forest	0.9	0.9	0.9	0.9	0.0	-0.2
A22/A275 Junction Transect	1	South	Forest	1.6	1.7	2.3	2.3	1.9	56.5
A22/A275 Junction Transect	2	South	Forest	1.5	1.7	2.1	2.2	1.6	49.2
A22/A275 Junction Transect	3	South	Forest	1.5	1.6	2.0	2.1	1.5	44.8
A22/A275 Junction Transect	4	South	Forest	1.4	1.6	2.0	2.0	1.4	41.7
A22/A275 Junction Transect	5	South	Forest	1.4	1.6	1.9	2.0	1.3	39.5
A22/A275 Junction Transect	7	South	Forest	1.4	1.5	1.9	1.9	1.3	37.6
A22/A275 Junction Transect	10	South	Forest	1.3	1.5	1.8	1.8	1.1	31.9
A22/A275 Junction Transect	15	South	Forest	1.3	1.4	1.7	1.7	1.0	29.0
A22/A275 Junction Transect	20	South	Forest	1.3	1.4	1.6	1.7	0.9	26.9
A22/A275 Junction Transect	25	South	Forest	1.3	1.4	1.6	1.6	0.9	25.2
A22/A275 Junction Transect	50	South	Forest	1.2	1.2	1.4	1.4	0.7	18.9
A22/A275 Junction Transect	100	South	Forest	1.1	1.1	1.2	1.2	0.4	12.4
A22/A275 Junction Transect	150	South	Forest	1.0	1.0	1.1	1.1	0.3	9.1
A22/A275 Junction Transect	200	South	Forest	1.0	1.0	1.1	1.1	0.2	7.0

Distance from Road Edge (m)		Side of Road	Habitat [a]	Total Concentration (µg/m³)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
A22/A275 SouthJunction Transect	0	West	Forest	1.7	1.9	2.1	2.1	1.0	17.9
	1	West	Forest	1.6	1.7	1.9	1.9	0.8	15.3
	2	West	Forest	1.5	1.6	1.8	1.8	0.7	14.1
	3	West	Forest	1.4	1.6	1.7	1.7	0.7	13.3
	4	West	Forest	1.4	1.5	1.6	1.6	0.6	12.7
	5	West	Forest	1.3	1.5	1.6	1.6	0.6	12.2
	7	West	Forest	1.3	1.4	1.5	1.5	0.5	11.4
	10	West	Forest	1.2	1.3	1.4	1.4	0.5	10.7
	15	West	Forest	1.2	1.2	1.3	1.3	0.4	10.1
	20	West	Forest	1.1	1.2	1.3	1.3	0.4	10.0
	25	West	Forest	1.1	1.2	1.3	1.3	0.4	10.2
	50	West	Forest	1.1	1.1	1.3	1.3	0.5	14.8
	100	West	Forest	1.1	1.2	1.4	1.4	0.7	23.9
	150	West	Forest	1.0	1.0	1.0	1.0	0.2	5.1
	200	West	Forest	0.9	0.9	1.0	1.0	0.1	2.6

Distance from Road Edge (m)		Side of Road	Habitat [a]	Total Concentration (µg/m³)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
A275 Transect	0	West	Mixed	1.5	1.7	2.4	2.5	2.4	80.7
	1	West	Mixed	1.4	1.5	2.1	2.1	1.9	61.6
	2	West	Mixed	1.3	1.4	1.9	1.9	1.6	52.2
	3	West	Mixed	1.2	1.3	1.8	1.8	1.4	45.6
	4	West	Mixed	1.2	1.3	1.7	1.7	1.2	40.6
	5	West	Mixed	1.2	1.2	1.6	1.6	1.1	36.6
	7	West	Mixed	1.1	1.2	1.5	1.5	0.9	30.6
	10	West	Mixed	1.1	1.1	1.4	1.4	0.7	24.3
	15	West	Mixed	1.0	1.1	1.2	1.3	0.5	17.9
	20	West	Mixed	1.0	1.0	1.2	1.2	0.4	14.0
	25	West	Mixed	1.0	1.0	1.1	1.1	0.4	11.4
	50	West	Mixed	0.9	1.0	1.0	1.0	0.2	5.6
	100	West	Mixed	0.9	0.9	1.0	1.0	0.1	2.5
	150	West	Mixed	0.9	0.9	0.9	0.9	0.0	1.5
	200	West	Mixed	0.9	0.9	0.9	0.9	0.0	1.1
	0	East	Grass	1.6	1.9	2.8	2.9	3.0	99.9
	1	East	Grass	1.5	1.6	2.3	2.4	2.3	75.0
	2	East	Grass	1.4	1.5	2.1	2.2	1.9	64.0
	3	East	Grass	1.5	1.6	2.4	2.4	2.4	78.2
	4	East	Grass	1.4	1.5	2.2	2.2	2.0	67.1
	5	East	Grass	1.3	1.5	2.0	2.1	1.8	58.9
	7	East	Grass	1.3	1.4	1.9	1.9	1.6	53.0
	10	East	Grass	1.3	1.4	1.8	1.8	1.5	48.3

Distance from Road Edge (m)		Side of Road	Habitat [a]	Total Concentration (µg/m³)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
	15	East	Grass	1.2	1.3	1.7	1.7	1.2	41.1
	20	East	Grass	1.2	1.2	1.5	1.6	1.0	33.5
	25	East	Grass	1.1	1.1	1.4	1.4	0.8	25.6
	50	East	Grass	1.1	1.1	1.3	1.3	0.6	20.6
	100	East	Grass	1.0	1.1	1.2	1.2	0.5	17.1
	150	East	Grass	1.0	1.0	1.1	1.1	0.3	9.1
	200	East	Grass	0.9	1.0	1.0	1.0	0.1	4.4
A22 (South Section) Receptor Transects									
West Wood Transect	0	West	Grass	1.7	1.9	2.0	2.0	0.9	13.0
West Wood Transect	1	West	Grass	1.6	1.8	1.9	1.9	0.7	11.0
West Wood Transect	2	West	Grass	1.5	1.6	1.7	1.7	0.6	9.7
West Wood Transect	3	West	Grass	1.4	1.6	1.6	1.7	0.6	8.6
West Wood Transect	4	West	Grass	1.4	1.5	1.6	1.6	0.5	7.9
West Wood Transect	5	West	Grass	1.3	1.5	1.5	1.5	0.5	7.2
West Wood Transect	7	West	Grass	1.3	1.4	1.4	1.4	0.4	6.2
West Wood Transect	10	West	Grass	1.2	1.3	1.3	1.4	0.3	5.2
West Wood Transect	15	West	Grass	1.1	1.2	1.2	1.3	0.3	4.0
West Wood Transect	20	West	Grass	1.1	1.2	1.2	1.2	0.2	3.3
West Wood Transect	25	West	Grass	1.1	1.1	1.1	1.1	0.2	2.8
West Wood Transect	50	West	Grass	1.0	1.0	1.0	1.0	0.1	1.5
West Wood Transect	100	West	Grass	0.9	1.0	1.0	1.0	0.0	0.8
West Wood Transect	150	West	Grass	0.9	0.9	0.9	0.9	0.0	0.5
West Wood Transect	200	West	Grass	0.9	0.9	0.9	0.9	0.0	0.4

Distance from Road Edge (m)		Side of Road	Habitat [a]	Total Concentration (µg/m^3)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
	0	East	Grass	2.2	2.5	2.7	2.7	1.4	21.0
	1	East	Grass	2.0	2.3	2.5	2.5	1.2	18.0
	2	East	Grass	1.9	2.1	2.3	2.3	1.0	16.0
	3	East	Grass	1.8	2.0	2.2	2.2	0.9	14.5
	4	East	Grass	1.7	1.9	2.1	2.1	0.9	13.2
	5	East	Grass	1.7	1.9	2.0	2.0	0.8	12.2
	7	East	Grass	1.6	1.7	1.8	1.8	0.7	10.6
	10	East	Grass	1.4	1.6	1.7	1.7	0.6	8.9
	15	East	Grass	1.3	1.4	1.5	1.5	0.5	7.0
	20	East	Grass	1.3	1.3	1.4	1.4	0.4	5.7
	25	East	Grass	1.2	1.3	1.3	1.3	0.3	4.9
	50	East	Grass	1.1	1.1	1.1	1.1	0.2	2.7
	100	East	Grass	1.0	1.0	1.0	1.0	0.1	1.4
	150	East	Grass	1.0	1.0	1.0	1.0	0.1	0.9
	200	East	Grass	0.9	1.0	1.0	1.0	0.0	0.7
Milbrook Farm Transect	0	West	Grass	1.6	1.8	1.9	1.9	0.7	11.1
	1	West	Grass	1.5	1.7	1.7	1.7	0.6	9.7
	2	West	Grass	1.4	1.6	1.7	1.7	0.6	8.8
	3	West	Grass	1.4	1.5	1.6	1.6	0.5	8.1
	4	West	Grass	1.4	1.5	1.6	1.6	0.5	7.5
	5	West	Grass	1.3	1.4	1.5	1.5	0.5	7.0
	10	West	Grass	1.2	1.3	1.4	1.4	0.4	5.4
	15	West	Grass	1.2	1.2	1.3	1.3	0.3	4.3

Distance from Road Edge (m)	Side of Road	Habitat [a]	Total Concentration (µg/m^3)				% Change Relative of Critical Level [b]	
			2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
20	West	Grass	1.1	1.2	1.2	1.2	0.2	3.6
25	West	Grass	1.1	1.1	1.2	1.2	0.2	3.0
50	West	Grass	1.0	1.0	1.0	1.0	0.1	1.7
100	West	Grass	0.9	1.0	1.0	1.0	0.1	0.8
150	West	Grass	0.9	0.9	0.9	0.9	0.0	0.5
200	West	Grass	0.9	0.9	0.9	0.9	0.0	0.4
0	East	Grass	2.1	2.4	2.6	2.6	1.2	19.0
1	East	Grass	2.0	2.2	2.4	2.4	1.1	17.2
2	East	Grass	1.9	2.1	2.3	2.3	1.0	15.8
3	East	Grass	1.8	2.0	2.2	2.2	1.0	14.7
4	East	Grass	1.7	2.0	2.1	2.1	0.9	13.8
5	East	Grass	1.7	1.9	2.0	2.0	0.8	13.0
10	East	Grass	1.5	1.7	1.8	1.8	0.7	10.1
15	East	Grass	1.4	1.5	1.6	1.6	0.5	8.2
20	East	Grass	1.3	1.4	1.5	1.5	0.4	6.9
25	East	Grass	1.3	1.4	1.4	1.4	0.4	5.9
50	East	Grass	1.1	1.2	1.2	1.2	0.2	3.3
100	East	Grass	1.0	1.0	1.0	1.0	0.1	1.7
150	East	Grass	1.0	1.0	1.0	1.0	0.1	1.1
200	East	Grass	0.9	1.0	1.0	1.0	0.1	0.8

Distance from Road Edge (m)		Side of Road	Habitat [a]	Total Concentration (µg/m^3)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
Little Birch Wood Transect	0	East	Forest	2.2	2.6	2.8	2.8	1.4	21.6
	1	East	Forest	2.0	2.4	2.5	2.6	1.2	18.8
	2	East	Forest	1.9	2.2	2.4	2.4	1.1	16.7
	3	East	Forest	1.8	2.1	2.2	2.2	1.0	15.2
	4	East	Forest	1.8	2.0	2.1	2.1	0.9	13.9
	5	East	Forest	1.7	1.9	2.0	2.0	0.8	12.8
	10	East	Forest	1.5	1.6	1.7	1.7	0.6	9.2
	15	East	Forest	1.3	1.5	1.5	1.5	0.5	7.1
	20	East	Forest	1.3	1.3	1.4	1.4	0.4	5.8
	25	East	Forest	1.2	1.3	1.3	1.3	0.3	4.8
	50	East	Forest	1.1	1.1	1.1	1.1	0.2	2.6
	100	East	Forest	1.0	1.0	1.0	1.0	0.1	1.3
	150	East	Forest	1.0	1.0	1.0	1.0	0.1	0.9
	200	East	Forest	0.9	1.0	1.0	1.0	0.0	0.7
A26 Receptor Transects									
Poplar Farm Transect	*0*	*West*	*Mixed*	*1.0*	*1.1*	*1.9*	*1.9*	*0.7*	*82.2*
	25	*West*	*Mixed*	*0.9*	*0.9*	*1.1*	*1.1*	*0.1*	*15.3*
	50	*West*	*Mixed*	*0.9*	*0.9*	*1.0*	*1.0*	*0.1*	*7.8*
	75	West	Mixed	0.9	0.9	1.0	1.0	0.0	5.0
	76	West	Mixed	0.9	0.9	1.0	1.0	0.0	4.9
	77	West	Mixed	0.9	0.9	1.0	1.0	0.0	4.8
	78	West	Mixed	0.9	0.9	1.0	1.0	0.0	4.7
	79	West	Mixed	0.9	0.9	1.0	1.0	0.0	4.7

Transect	Distance from Road Edge (m)	Side of Road	Habitat [a]	Total Concentration ($\mu g/m^3$)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
	80	West	Mixed	0.9	0.9	1.0	1.0	0.0	4.6
	82	West	Mixed	0.9	0.9	1.0	1.0	0.0	4.5
	85	West	Mixed	0.9	0.9	1.0	1.0	0.0	4.3
	90	West	Mixed	0.9	0.9	0.9	0.9	0.0	4.0
	95	West	Mixed	0.9	0.9	0.9	0.9	0.0	3.8
	100	West	Mixed	0.9	0.9	0.9	0.9	0.0	3.5
	105	West	Mixed	0.9	0.9	0.9	0.9	0.0	3.4
	130	West	Mixed	0.9	0.9	0.9	0.9	0.0	2.6
	155	West	Mixed	0.9	0.9	0.9	0.9	0.0	2.1
	180	West	Mixed	0.9	0.9	0.9	0.9	0.0	1.7
	200	West	Mixed	0.9	0.9	0.9	0.9	0.0	1.5
Owl House Transect	0	Northwest	Mixed	1.1	1.2	2.4	2.4	1.0	121.5
	1	Northwest	Mixed	1.1	1.1	2.1	2.1	0.8	100.8
	2	Northwest	Mixed	1.1	1.1	2.0	2.0	0.7	88.2
	3	Northwest	Mixed	1.0	1.1	1.9	1.9	0.7	78.8
	4	Northwest	Mixed	1.0	1.1	1.8	1.8	0.6	71.3
	5	Northwest	Mixed	1.0	1.0	1.7	1.7	0.5	65.2
	10	Northwest	Mixed	1.0	1.0	1.4	1.4	0.4	45.1
	15	Northwest	Mixed	1.0	1.0	1.3	1.3	0.3	33.8
	20	Northwest	Mixed	0.9	1.0	1.2	1.2	0.2	26.6
	25	Northwest	Mixed	0.9	0.9	1.2	1.2	0.2	21.6
	50	Northwest	Mixed	0.9	0.9	1.0	1.0	0.1	10.2
	100	Northwest	Mixed	0.9	0.9	1.0	1.0	0.0	4.2

Distance from Road Edge (m)		Side of Road	Habitat [a]	Total Concentration (µg/m³)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
	150	Northwest	Mixed	0.9	0.9	0.9	0.9	0.0	2.4
	200	Northwest	Mixed	0.9	0.9	0.9	0.9	0.0	1.6
Poundgate Transect	0	East	Mixed	1.1	1.1	2.2	2.2	0.9	105.7
	1	East	Mixed	1.1	1.1	2.0	2.0	0.8	90.0
	2	East	Mixed	1.0	1.1	1.9	1.9	0.7	80.0
	3	East	Mixed	1.0	1.1	1.8	1.8	0.6	72.5
	4	East	Mixed	1.0	1.0	1.7	1.7	0.6	66.5
	5	East	Mixed	1.0	1.0	1.6	1.6	0.5	61.4
	7	East	Mixed	1.0	1.0	1.5	1.5	0.5	53.3
	10	East	Mixed	1.0	1.0	1.4	1.4	0.4	44.3
	15	East	Mixed	1.0	1.0	1.3	1.3	0.3	34.4
	20	East	Mixed	0.9	1.0	1.2	1.2	0.2	27.9
	25	East	Mixed	0.9	0.9	1.2	1.2	0.2	23.3
	50	East	Mixed	0.9	0.9	1.1	1.1	0.1	12.5
	100	East	Mixed	0.9	0.9	1.0	1.0	0.1	6.4
	150	East	Mixed	0.9	0.9	1.0	1.0	0.0	4.2
	200	East	Mixed	0.9	0.9	0.9	0.9	0.0	3.1

[a] Where habitat is mixed (grass and forest), the deposition velocity for forest has been used which provides a worst-case assessment.

[b] Critical Level for Ammonia is 1 µg/m³.

Nitrogen Deposition

Table A2.3: Model Results for Nitrogen Deposition

	Distance from Road Edge (m)	Side of Road	Habitat [a]	Total Concentration (µg/m³)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
A22 (North Section) Receptor Transects									
Kidbrooke Wood Transect	**0**	North	Forest	43.4	33.7	29.8	29.7	-0.7	-39.8
Kidbrooke Wood Transect	1	North	Forest	40.4	31.5	28.2	28.1	-0.6	-33.6
Kidbrooke Wood Transect	2	North	Forest	38.6	30.1	27.2	27.1	-0.5	-29.5
Kidbrooke Wood Transect	3	North	Forest	37.1	29.0	26.4	26.4	-0.5	-26.4
Kidbrooke Wood Transect	4	North	Forest	36.0	28.2	25.8	25.8	-0.4	-24.0
Kidbrooke Wood Transect	5	North	Forest	35.1	27.5	25.3	25.3	-0.4	-22.0
Kidbrooke Wood Transect	7	North	Forest	33.6	26.4	24.5	24.5	-0.4	-18.8
Kidbrooke Wood Transect	10	North	Forest	31.9	25.2	23.7	23.7	-0.3	-15.4
Kidbrooke Wood Transect	15	North	Forest	30.1	24.0	22.9	22.8	-0.2	-11.9
Kidbrooke Wood Transect	20	North	Forest	29.0	23.3	22.3	22.3	-0.2	-9.7
Kidbrooke Wood Transect	25	North	Forest	28.1	22.7	21.9	21.9	-0.2	-8.1
Kidbrooke Wood Transect	50	North	Forest	25.9	21.4	21.0	21.0	-0.1	-4.2
Kidbrooke Wood Transect	100	North	Forest	24.4	20.6	20.5	20.4	0.0	-1.9
Kidbrooke Wood Transect	150	North	Forest	23.9	20.4	20.3	20.3	0.0	-1.1
Kidbrooke Wood Transect	200	North	Forest	23.7	20.3	20.2	20.2	0.0	-0.8
Kidbrooke Wood Transect	0	South	Forest	39.9	30.7	27.6	27.6	-0.6	-31.8
Kidbrooke Wood Transect	1	South	Forest	36.7	28.6	26.1	26.0	-0.4	-25.4
Kidbrooke Wood Transect	2	South	Forest	35.0	27.3	25.2	25.1	-0.4	-21.7
Kidbrooke Wood Transect	3	South	Forest	33.7	26.4	24.6	24.5	-0.3	-19.1

Distance from Road Edge (m)		Side of Road	Habitat [a]	Total Concentration (µg/m³)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
	4	South	Forest	32.7	25.7	24.1	24.0	-0.3	-17.1
	5	South	Forest	31.9	25.2	23.7	23.7	-0.3	-15.5
	7	South	Forest	30.7	24.4	23.1	23.1	-0.2	-13.1
	10	South	Forest	29.4	23.6	22.5	22.5	-0.2	-10.7
	15	South	Forest	28.1	22.7	21.9	21.9	-0.2	-8.2
	20	South	Forest	27.2	22.2	21.6	21.6	-0.1	-6.6
	25	South	Forest	26.6	21.9	21.3	21.3	-0.1	-5.6
	50	South	Forest	25.1	21.1	20.7	20.7	-0.1	-3.1
	100	South	Forest	24.3	20.6	20.4	20.4	0.0	-1.8
	150	South	Forest	24.1	20.5	20.4	20.4	0.0	-1.5
	200	South	Forest	24.0	20.5	20.3	20.3	0.0	-1.3
Stone Quarry House Transect	0	East	Forest	42.1	32.3	28.8	28.7	-0.7	-36.1
	1	East	Forest	39.1	30.4	27.4	27.4	-0.6	-30.7
	2	East	Forest	37.3	29.2	26.5	26.5	-0.5	-27.0
	3	East	Forest	36.0	28.2	25.9	25.8	-0.4	-24.2
	4	East	Forest	34.9	27.5	25.3	25.3	-0.4	-22.1
	5	East	Forest	34.1	26.9	24.9	24.9	-0.4	-20.3
	7	East	Forest	32.7	25.9	24.2	24.2	-0.3	-17.5
	10	East	Forest	31.3	24.9	23.5	23.5	-0.2	-14.6
	15	East	Forest	29.7	23.9	22.8	22.7	-0.2	-11.5
	20	East	Forest	28.7	23.2	22.3	22.3	-0.2	-9.5
	25	East	Forest	27.9	22.7	21.9	21.9	-0.2	-8.1
	50	East	Forest	26.1	21.6	21.1	21.1	-0.1	-4.7

Distance from Road Edge (m)		Side of Road	Habitat [a]	Total Concentration (µg/m³)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
	100	East	Forest	24.8	20.9	20.6	20.6	0.0	-2.6
	150	East	Forest	24.3	20.6	20.4	20.4	0.0	-1.8
	200	East	Forest	24.1	20.5	20.3	20.3	0.0	-1.4
	0	West	Forest	35.6	27.7	25.4	25.4	-0.4	-22.7
	1	West	Forest	33.4	26.2	24.4	24.4	-0.3	-18.5
	2	West	Forest	32.0	25.4	23.8	23.8	-0.3	-15.9
	3	West	Forest	31.1	24.8	23.4	23.3	-0.2	-14.1
	4	West	Forest	30.3	24.3	23.0	23.0	-0.2	-12.7
	5	West	Forest	29.7	23.9	22.8	22.7	-0.2	-11.5
	7	West	Forest	28.8	23.3	22.3	22.3	-0.2	-9.9
	10	West	Forest	27.9	22.7	21.9	21.9	-0.2	-8.1
	15	West	Forest	26.8	22.1	21.5	21.5	-0.1	-6.2
	20	West	Forest	26.2	21.7	21.2	21.2	-0.1	-5.0
	25	West	Forest	25.7	21.4	21.0	21.0	-0.1	-4.2
	50	West	Forest	24.6	20.8	20.5	20.5	0.0	-2.3
	100	West	Forest	23.9	20.4	20.3	20.3	0.0	-1.1
	150	West	Forest	23.6	20.2	20.2	20.2	0.0	-0.7
	200	West	Forest	23.5	20.2	20.1	20.1	0.0	-0.5

	Distance from Road Edge (m)	Side of Road	Habitat [a]	Total Concentration (µg/m³)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
A22/A275 Junction Receptor Transects									
Hindleap Warren Transect	0	East	Forest	42.1	32.7	29.1	29.1	-0.7	-36.6
	1	East	Forest	39.6	31.0	27.9	27.8	-0.6	-31.6
	2	East	Forest	37.8	29.7	26.9	26.9	-0.5	-27.8
	3	East	Forest	36.5	28.7	26.2	26.2	-0.5	-24.8
	4	East	Forest	35.4	27.9	25.7	25.6	-0.4	-22.5
	5	East	Forest	34.5	27.2	25.2	25.2	-0.4	-20.6
	7	East	Forest	33.1	26.2	24.5	24.4	-0.3	-17.6
	10	East	Forest	31.6	25.1	23.7	23.7	-0.3	-14.4
	15	East	Forest	29.9	23.9	22.9	22.8	-0.2	-11.0
	20	East	Forest	28.8	23.2	22.3	22.3	-0.2	-8.8
	25	East	Forest	28.0	22.7	22.0	22.0	-0.1	-7.3
	50	East	Forest	26.0	21.5	21.1	21.1	-0.1	-3.6
	100	East	Forest	24.7	20.8	20.7	20.6	0.0	-1.4
	150	East	Forest	24.2	20.5	20.5	20.5	0.0	-0.5
	200	East	Forest	24.0	20.4	20.4	20.4	0.0	-0.1
	0	West	Forest	36.7	28.5	26.1	26.1	-0.5	-24.7
	1	West	Forest	34.5	27.1	25.1	25.1	-0.4	-20.4
	2	West	Forest	33.1	26.2	24.4	24.4	-0.3	-17.7
	3	West	Forest	32.1	25.5	23.9	23.9	-0.3	-15.6
	4	West	Forest	31.3	24.9	23.6	23.5	-0.2	-14.1
	5	West	Forest	30.7	24.5	23.3	23.2	-0.2	-12.8
	7	West	Forest	29.7	23.9	22.8	22.8	-0.2	-10.9

Distance from Road Edge (m)		Side of Road	Habitat [a]	Total Concentration (µg/m³)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
	10	West	Forest	28.6	23.2	22.3	22.3	-0.1	-8.8
	15	West	Forest	27.4	22.4	21.8	21.7	-0.1	-6.6
	20	West	Forest	26.7	21.9	21.4	21.4	-0.1	-5.2
	25	West	Forest	26.1	21.6	21.2	21.2	-0.1	-4.2
	50	West	Forest	24.8	20.9	20.7	20.6	0.0	-2.0
	100	West	Forest	23.9	20.4	20.3	20.3	0.0	-0.8
	150	West	Forest	23.6	20.3	20.2	20.2	0.0	-0.4
	200	West	Forest	23.5	20.2	20.2	20.2	0.0	-0.2
A22/A275 Junction Transect	1	South	Forest	38.9	29.8	36.2	36.4	2.2	66.8
	2	South	Forest	37.7	28.9	34.5	34.7	1.9	58.3
	3	South	Forest	36.8	28.3	33.4	33.6	1.7	52.9
	4	South	Forest	36.2	27.9	32.6	32.8	1.6	49.0
	5	South	Forest	35.7	27.6	32.0	32.2	1.5	46.1
	7	South	Forest	35.2	27.3	31.5	31.7	1.5	43.7
	10	South	Forest	33.8	26.4	29.9	30.0	1.2	36.3
	15	South	Forest	32.9	25.8	29.0	29.1	1.1	32.6
	20	South	Forest	32.3	25.4	28.3	28.4	1.0	30.1
	25	South	Forest	31.8	25.1	27.8	27.9	1.0	28.1
	50	South	Forest	29.7	23.8	25.8	25.9	0.7	21.0
	100	South	Forest	27.5	22.4	23.7	23.8	0.5	13.9
	150	South	Forest	26.3	21.7	22.7	22.7	0.3	10.4
	200	South	Forest	25.5	21.2	22.0	22.1	0.3	8.1

Distance from Road Edge (m)		Side of Road	Habitat [a]	Total Concentration (µg/m³)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
A22/A275 SouthJunction Transect	0	West	Forest	39.5	30.7	32.5	32.6	1.0	18.6
	1	West	Forest	37.1	29.1	30.7	30.8	0.9	16.7
	2	West	Forest	35.7	28.1	29.5	29.6	0.8	15.5
	3	West	Forest	34.6	27.3	28.7	28.8	0.8	14.7
	4	West	Forest	33.8	26.7	28.0	28.1	0.7	14.0
	5	West	Forest	33.1	26.2	27.4	27.5	0.7	13.5
	7	West	Forest	32.0	25.4	26.6	26.6	0.6	12.7
	10	West	Forest	30.9	24.6	25.7	25.8	0.6	11.9
	15	West	Forest	29.6	23.7	24.8	24.8	0.5	11.4
	20	West	Forest	28.8	23.2	24.3	24.3	0.5	11.3
	25	West	Forest	28.3	22.8	23.9	24.0	0.4	11.5
	50	West	Forest	27.7	22.5	24.1	24.2	0.5	16.6
	100	West	Forest	28.2	22.9	25.5	25.6	0.8	26.5
	150	West	Forest	24.8	20.8	21.4	21.4	0.2	6.0
	200	West	Forest	24.1	20.5	20.8	20.8	0.1	3.2

	Distance from Road Edge (m)	Side of Road	Habitat [a]	Total Concentration (µg/m³)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
A275 Transect	0	West	Mixed	35.3	28.1	36.3	36.5	2.5	84.4
	1	West	Mixed	33.0	26.5	33.1	33.3	2.1	68.1
	2	West	Mixed	31.7	25.5	31.2	31.4	1.7	58.2
	3	West	Mixed	30.8	24.9	29.8	30.0	1.5	51.0
	4	West	Mixed	30.1	24.3	28.8	28.9	1.4	45.5
	5	West	Mixed	29.5	23.9	27.9	28.0	1.2	41.1
	7	West	Mixed	28.6	23.3	26.6	26.7	1.0	34.4
	10	West	Mixed	27.6	22.6	25.3	25.4	0.8	27.4
	15	West	Mixed	26.6	22.0	23.9	24.0	0.6	20.4
	20	West	Mixed	26.0	21.6	23.1	23.2	0.5	16.1
	25	West	Mixed	25.5	21.3	22.6	22.6	0.4	13.2
	50	West	Mixed	24.5	20.7	21.3	21.4	0.2	6.7
	100	West	Mixed	23.8	20.4	20.7	20.7	0.1	3.1
	150	West	Mixed	23.6	20.2	20.4	20.4	0.1	2.0
	200	West	Mixed	23.5	20.2	20.3	20.3	0.0	1.4
	0	East	Grass	22.4	18.6	25.0	25.2	2.0	66.4
	1	East	Grass	21.0	17.4	22.8	22.9	1.6	54.8
	2	East	Grass	20.1	16.7	21.3	21.4	1.4	47.2
	3	East	Grass	19.4	16.1	20.2	20.3	1.2	41.3
	4	East	Grass	18.9	15.7	19.3	19.4	1.1	37.1
	5	East	Grass	18.5	15.4	18.7	18.8	1.0	33.7
	7	East	Grass	17.9	14.9	17.7	17.8	0.9	28.5
	10	East	Grass	17.3	14.4	16.6	16.7	0.7	23.0

Distance from Road Edge (m)		Side of Road	Habitat [a]	Total Concentration (µg/m³)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
	15	East	Grass	16.6	13.9	15.6	15.6	0.5	17.4
	20	East	Grass	16.1	13.5	14.9	14.9	0.4	14.0
	25	East	Grass	15.8	13.3	14.4	14.5	0.4	11.6
	50	East	Grass	15.1	12.8	13.4	13.4	0.2	6.2
	100	East	Grass	14.6	12.5	12.8	12.8	0.1	3.1
	150	East	Grass	14.5	12.4	12.6	12.6	0.1	2.0
	200	East	Grass	14.4	12.4	12.5	12.5	0.0	1.5
A22 (South Section) Receptor Transects									
West Wood Transect	0	West	Grass	23.1	18.9	19.6	19.7	0.6	8.2
West Wood Transect	1	West	Grass	22.0	18.0	18.7	18.7	0.5	7.2
West Wood Transect	2	West	Grass	21.1	17.3	17.9	18.0	0.4	6.3
West Wood Transect	3	West	Grass	20.5	16.8	17.3	17.3	0.4	5.7
West Wood Transect	4	West	Grass	19.9	16.4	16.8	16.9	0.4	5.2
West Wood Transect	5	West	Grass	19.5	16.0	16.5	16.5	0.3	4.7
West Wood Transect	7	West	Grass	18.8	15.5	15.8	15.9	0.3	4.1
West Wood Transect	10	West	Grass	18.1	14.9	15.2	15.2	0.2	3.4
West Wood Transect	15	West	Grass	17.2	14.3	14.5	14.5	0.2	2.6
West Wood Transect	20	West	Grass	16.7	13.9	14.1	14.1	0.2	2.1
West Wood Transect	25	West	Grass	16.3	13.6	13.8	13.8	0.1	1.8
West Wood Transect	50	West	Grass	15.3	12.9	13.0	13.0	0.1	1.0
West Wood Transect	100	West	Grass	14.7	12.6	12.6	12.6	0.0	0.5
West Wood Transect	150	West	Grass	14.5	12.4	12.5	12.5	0.0	0.3
West Wood Transect	200	West	Grass	14.4	12.4	12.4	12.4	0.0	0.3

Distance from Road Edge (m)		Side of Road	Habitat [a]	Total Concentration (µg/m³)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
	0	East	Grass	27.7	22.8	24.0	24.1	0.9	12.9
	1	East	Grass	26.4	21.7	22.8	22.9	0.8	11.7
	2	East	Grass	25.2	20.7	21.7	21.8	0.7	10.4
	3	East	Grass	24.3	19.9	20.8	20.9	0.6	9.5
	4	East	Grass	23.5	19.2	20.1	20.1	0.6	8.6
	5	East	Grass	22.9	18.7	19.4	19.5	0.6	8.0
	7	East	Grass	21.8	17.8	18.5	18.5	0.5	6.9
	10	East	Grass	20.7	16.9	17.4	17.4	0.4	5.8
	15	East	Grass	19.4	15.8	16.2	16.3	0.3	4.5
	20	East	Grass	18.5	15.1	15.5	15.5	0.3	3.7
	25	East	Grass	17.9	14.7	15.0	15.0	0.2	3.1
	50	East	Grass	16.3	13.6	13.7	13.7	0.1	1.7
	100	East	Grass	15.2	12.9	13.0	13.0	0.1	0.9
	150	East	Grass	14.8	12.6	12.7	12.7	0.0	0.6
	200	East	Grass	14.7	12.5	12.6	12.6	0.0	0.5
Milbrook Farm Transect	0	West	Grass	22.6	18.3	19.0	19.0	0.5	7.5
	1	West	Grass	21.8	17.7	18.3	18.3	0.5	6.7
	2	West	Grass	21.1	17.2	17.7	17.8	0.4	6.1
	3	West	Grass	20.7	16.8	17.3	17.3	0.4	5.6
	4	West	Grass	20.2	16.4	16.9	17.0	0.4	5.2
	5	West	Grass	19.8	16.1	16.6	16.6	0.3	4.9
	10	West	Grass	18.5	15.1	15.5	15.5	0.3	3.6
	15	West	Grass	17.7	14.5	14.8	14.8	0.2	2.8

Distance from Road Edge (m)	Side of Road	Habitat [a]	Total Concentration (µg/m³)				% Change Relative of Critical Level [b]	
			2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
20	West	Grass	17.1	14.1	14.3	14.3	0.2	2.3
25	West	Grass	16.7	13.8	14.0	14.0	0.1	2.0
50	West	Grass	15.5	13.0	13.1	13.1	0.1	1.1
100	West	Grass	14.8	12.6	12.6	12.7	0.0	0.5
150	West	Grass	14.5	12.4	12.5	12.5	0.0	0.4
200	West	Grass	14.4	12.4	12.4	12.4	0.0	0.3
0	East	Grass	27.8	22.8	24.0	24.1	0.9	12.8
1	East	Grass	27.0	22.1	23.2	23.3	0.8	12.0
2	East	Grass	26.1	21.3	22.4	22.4	0.8	11.1
3	East	Grass	25.4	20.7	21.7	21.7	0.7	10.3
4	East	Grass	24.7	20.2	21.1	21.1	0.7	9.7
5	East	Grass	24.2	19.6	20.5	20.5	0.6	9.0
10	East	Grass	22.1	17.8	18.5	18.5	0.5	6.9
15	East	Grass	20.7	16.7	17.2	17.2	0.4	5.5
20	East	Grass	19.7	15.9	16.3	16.3	0.3	4.5
25	East	Grass	18.9	15.3	15.7	15.7	0.3	3.8
50	East	Grass	16.9	13.9	14.1	14.1	0.2	2.1
100	East	Grass	15.6	13.1	13.2	13.2	0.1	1.1
150	East	Grass	15.1	12.8	12.8	12.8	0.1	0.7
200	East	Grass	14.8	12.6	12.6	12.7	0.0	0.5

	Distance from Road Edge (m)	Side of Road	Habitat [a]	Total Concentration (µg/m³)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
Little Birch Wood Transect	0	East	Forest	49.8	38.8	41.0	41.2	1.6	23.1
	1	East	Forest	47.0	36.7	38.6	38.7	1.4	20.5
	2	East	Forest	44.9	34.9	36.6	36.8	1.3	18.4
	3	East	Forest	43.2	33.5	35.1	35.2	1.1	16.7
	4	East	Forest	41.8	32.4	33.8	33.9	1.0	15.2
	5	East	Forest	40.6	31.4	32.7	32.8	0.9	14.0
	10	East	Forest	36.3	28.1	29.0	29.1	0.7	10.0
	15	East	Forest	33.8	26.3	27.0	27.0	0.5	7.7
	20	East	Forest	32.0	25.1	25.7	25.7	0.4	6.3
	25	East	Forest	30.8	24.3	24.7	24.8	0.4	5.3
	50	East	Forest	27.6	22.3	22.6	22.6	0.2	2.9
	100	East	Forest	25.6	21.2	21.4	21.4	0.1	1.6
	150	East	Forest	24.8	20.8	20.9	20.9	0.1	1.1
	200	East	Forest	24.4	20.6	20.7	20.7	0.1	0.8
A26 Receptor Transects									
Poplar Farm Transect	*0*	*West*	*Mixed*	*26.1*	*21.9*	*30.9*	*31.0*	*0.8*	*91.1*
	25	*West*	*Mixed*	*23.7*	*20.3*	*22.1*	*22.1*	*0.2*	*17.9*
	50	*West*	*Mixed*	*23.4*	*20.2*	*21.1*	*21.1*	*0.1*	*9.4*
	75	West	Mixed	23.3	20.1	20.7	20.7	0.1	6.2
	76	West	Mixed	23.3	20.1	20.7	20.7	0.1	6.2
	77	West	Mixed	23.3	20.1	20.7	20.7	0.1	6.1
	78	West	Mixed	23.3	20.1	20.7	20.7	0.0	6.0
	79	West	Mixed	23.3	20.1	20.7	20.7	0.0	5.9

Distance from Road Edge (m)		Side of Road	Habitat [a]	Total Concentration ($\mu g/m^3$)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
	80	West	Mixed	23.3	20.1	20.7	20.7	0.1	5.8
	82	West	Mixed	23.3	20.1	20.7	20.7	0.1	5.7
	85	West	Mixed	23.3	20.1	20.6	20.6	0.1	5.5
	90	West	Mixed	23.3	20.1	20.6	20.6	0.0	5.1
	95	West	Mixed	23.2	20.1	20.6	20.6	0.1	4.9
	100	West	Mixed	23.2	20.1	20.5	20.5	0.1	4.6
	105	West	Mixed	23.2	20.1	20.5	20.5	0.1	4.4
	130	West	Mixed	23.2	20.0	20.4	20.4	0.0	3.5
	155	West	Mixed	23.2	20.0	20.3	20.3	0.0	2.8
	180	West	Mixed	23.1	20.0	20.3	20.3	0.0	2.4
	200	West	Mixed	23.1	20.0	20.2	20.2	0.0	2.1
Owl House Transect	0	Northwest	Mixed	27.7	22.9	36.5	36.6	1.1	136.6
	1	Northwest	Mixed	27.0	22.5	34.0	34.1	1.0	116.1
	2	Northwest	Mixed	26.6	22.2	32.3	32.4	0.9	102.1
	3	Northwest	Mixed	26.3	21.9	31.0	31.1	0.8	91.3
	4	Northwest	Mixed	26.0	21.7	29.9	30.0	0.7	82.6
	5	Northwest	Mixed	25.8	21.6	29.1	29.1	0.6	75.4
	10	Northwest	Mixed	25.0	21.1	26.2	26.3	0.4	52.1
	15	Northwest	Mixed	24.5	20.8	24.7	24.7	0.3	39.2
	20	Northwest	Mixed	24.3	20.6	23.7	23.7	0.3	31.1
	25	Northwest	Mixed	24.1	20.5	23.0	23.1	0.2	25.5
	50	Northwest	Mixed	23.6	20.2	21.5	21.5	0.1	12.6
	100	Northwest	Mixed	23.3	20.1	20.6	20.6	0.1	5.5

Distance from Road Edge (m)		Side of Road	Habitat [a]	Total Concentration (µg/m³)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
	150	Northwest	Mixed	23.2	20.0	20.4	20.4	0.0	3.2
	200	Northwest	Mixed	23.1	20.0	20.2	20.2	0.0	2.2
Poundgate Transect	0	East	Mixed	27.0	22.5	34.3	34.4	1.0	119.2
Poundgate Transect	1	East	Mixed	26.5	22.2	32.5	32.6	0.9	104.5
Poundgate Transect	2	East	Mixed	26.2	21.9	31.2	31.3	0.8	93.4
Poundgate Transect	3	East	Mixed	25.9	21.8	30.2	30.2	0.7	84.6
Poundgate Transect	4	East	Mixed	25.7	21.6	29.3	29.3	0.7	77.4
Poundgate Transect	5	East	Mixed	25.5	21.5	28.5	28.6	0.6	71.3
Poundgate Transect	7	East	Mixed	25.2	21.3	27.4	27.4	0.5	61.5
Poundgate Transect	10	East	Mixed	24.9	21.0	26.1	26.1	0.4	50.9
Poundgate Transect	15	East	Mixed	24.5	20.8	24.7	24.7	0.3	39.4
Poundgate Transect	20	East	Mixed	24.2	20.6	23.8	23.8	0.3	32.0
Poundgate Transect	25	East	Mixed	24.1	20.5	23.2	23.2	0.2	26.9
Poundgate Transect	50	East	Mixed	23.6	20.3	21.8	21.8	0.1	14.9
Poundgate Transect	100	East	Mixed	23.4	20.1	20.9	20.9	0.1	7.9
Poundgate Transect	150	East	Mixed	23.3	20.1	20.6	20.6	0.1	5.4
Poundgate Transect	200	East	Mixed	23.2	20.1	20.4	20.5	0.0	4.0

[a] Where habitat is mixed (grass and forest), the deposition velocity for forest has been used which provides a worst-case assessment.

[b] Critical Level for Nitrogen Deposition is 10 µg/m³.

Table A2.4: Model Results for Acid Deposition

Distance from Road Edge (m)		Side of Road	Habitat [a]	Total Concentration (µg/m^3)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
A22 (North Section) Receptor Transects									
Kidbrooke Wood Transect	0	North	Forest	3.1	2.4	2.1	2.1	-0.5	-29.9
	1	North	Forest	2.9	2.3	2.0	2.0	-0.4	-25.2
	2	North	Forest	2.8	2.1	1.9	1.9	-0.4	-22.1
	3	North	Forest	2.7	2.1	1.9	1.9	-0.4	-19.8
	4	North	Forest	2.6	2.0	1.8	1.8	-0.3	-18.0
	5	North	Forest	2.5	2.0	1.8	1.8	-0.3	-16.5
	7	North	Forest	2.4	1.9	1.8	1.7	-0.3	-14.1
	10	North	Forest	2.3	1.8	1.7	1.7	-0.2	-11.6
	15	North	Forest	2.2	1.7	1.6	1.6	-0.2	-8.9
	20	North	Forest	2.1	1.7	1.6	1.6	-0.1	-7.3
	25	North	Forest	2.0	1.6	1.6	1.6	-0.1	-6.1
	50	North	Forest	1.8	1.5	1.5	1.5	0.0	-3.2
	100	North	Forest	1.7	1.5	1.5	1.5	0.0	-1.4
	150	North	Forest	1.7	1.5	1.4	1.4	0.0	-0.8
	200	North	Forest	1.7	1.4	1.4	1.4	0.0	-0.6
	0	South	Forest	2.9	2.2	2.0	2.0	-0.4	-23.8
	1	South	Forest	2.6	2.0	1.9	1.9	-0.3	-19.1
	2	South	Forest	2.5	2.0	1.8	1.8	-0.3	-16.3
	3	South	Forest	2.4	1.9	1.8	1.8	-0.3	-14.4
	4	South	Forest	2.3	1.8	1.7	1.7	-0.2	-12.8
	5	South	Forest	2.3	1.8	1.7	1.7	-0.2	-11.7

	Distance from Road Edge (m)	Side of Road	Habitat [a]	Total Concentration (µg/m³)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
	7	South	Forest	2.2	1.7	1.7	1.6	-0.2	-9.8
	10	South	Forest	2.1	1.7	1.6	1.6	-0.2	-8.0
	15	South	Forest	2.0	1.6	1.6	1.6	-0.1	-6.1
	20	South	Forest	1.9	1.6	1.5	1.5	-0.1	-5.0
	25	South	Forest	1.9	1.6	1.5	1.5	-0.1	-4.2
	50	South	Forest	1.8	1.5	1.5	1.5	0.0	-2.3
	100	South	Forest	1.7	1.5	1.5	1.5	0.0	-1.4
	150	South	Forest	1.7	1.5	1.5	1.5	0.0	-1.1
	200	South	Forest	1.7	1.5	1.5	1.5	0.0	-1.0
Stone Quarry House Transect	0	East	Forest	3.0	2.3	2.1	2.1	-0.5	-27.1
	1	East	Forest	2.8	2.2	2.0	2.0	-0.4	-23.0
	2	East	Forest	2.7	2.1	1.9	1.9	-0.4	-20.2
	3	East	Forest	2.6	2.0	1.8	1.8	-0.3	-18.2
	4	East	Forest	2.5	2.0	1.8	1.8	-0.3	-16.6
	5	East	Forest	2.4	1.9	1.8	1.8	-0.3	-15.2
	7	East	Forest	2.3	1.9	1.7	1.7	-0.2	-13.1
	10	East	Forest	2.2	1.8	1.7	1.7	-0.2	-10.9
	15	East	Forest	2.1	1.7	1.6	1.6	-0.2	-8.6
	20	East	Forest	2.0	1.7	1.6	1.6	-0.1	-7.1
	25	East	Forest	2.0	1.6	1.6	1.6	-0.1	-6.1
	50	East	Forest	1.9	1.5	1.5	1.5	-0.1	-3.5
	100	East	Forest	1.8	1.5	1.5	1.5	0.0	-2.0
	150	East	Forest	1.7	1.5	1.5	1.5	0.0	-1.4

Distance from Road Edge (m)	Side of Road	Habitat [a]	Total Concentration (µg/m³)				% Change Relative of Critical Level [b]	
			2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
200	East	Forest	1.7	1.5	1.5	1.5	0.0	-1.1
0	West	Forest	2.5	2.0	1.8	1.8	-0.3	-17.1
1	West	Forest	2.4	1.9	1.7	1.7	-0.3	-13.9
2	West	Forest	2.3	1.8	1.7	1.7	-0.2	-11.9
3	West	Forest	2.2	1.8	1.7	1.7	-0.2	-10.6
4	West	Forest	2.2	1.7	1.6	1.6	-0.2	-9.5
5	West	Forest	2.1	1.7	1.6	1.6	-0.1	-8.7
7	West	Forest	2.1	1.7	1.6	1.6	-0.1	-7.4
10	West	Forest	2.0	1.6	1.6	1.6	-0.1	-6.1
15	West	Forest	1.9	1.6	1.5	1.5	-0.1	-4.6
20	West	Forest	1.9	1.5	1.5	1.5	-0.1	-3.7
25	West	Forest	1.8	1.5	1.5	1.5	-0.1	-3.2
50	West	Forest	1.8	1.5	1.5	1.5	0.0	-1.7
100	West	Forest	1.7	1.5	1.4	1.4	0.0	-0.8
150	West	Forest	1.7	1.4	1.4	1.4	0.0	-0.6
200	West	Forest	1.7	1.4	1.4	1.4	0.0	-0.4

	Distance from Road Edge (m)	Side of Road	Habitat [a]	Total Concentration (µg/m³)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
A22/A275 Junction Receptor Transects									
Hindleap Warren Transect	0	East	Forest	3.0	2.3	2.1	2.1	-0.5	-27.5
	1	East	Forest	2.8	2.2	2.0	2.0	-0.4	-23.7
	2	East	Forest	2.7	2.1	1.9	1.9	-0.4	-20.8
	3	East	Forest	2.6	2.0	1.9	1.9	-0.3	-18.6
	4	East	Forest	2.5	2.0	1.8	1.8	-0.3	-16.9
	5	East	Forest	2.5	1.9	1.8	1.8	-0.3	-15.4
	7	East	Forest	2.4	1.9	1.7	1.7	-0.2	-13.2
	10	East	Forest	2.3	1.8	1.7	1.7	-0.2	-10.8
	15	East	Forest	2.1	1.7	1.6	1.6	-0.2	-8.2
	20	East	Forest	2.1	1.7	1.6	1.6	-0.1	-6.6
	25	East	Forest	2.0	1.6	1.6	1.6	-0.1	-5.5
	50	East	Forest	1.9	1.5	1.5	1.5	0.0	-2.7
	100	East	Forest	1.8	1.5	1.5	1.5	0.0	-1.0
	150	East	Forest	1.7	1.5	1.5	1.5	0.0	-0.4
	200	East	Forest	1.7	1.5	1.5	1.5	0.0	-0.1
	0	West	Forest	2.6	2.0	1.9	1.9	-0.3	-18.5
	1	West	Forest	2.5	1.9	1.8	1.8	-0.3	-15.3
	2	West	Forest	2.4	1.9	1.7	1.7	-0.2	-13.3
	3	West	Forest	2.3	1.8	1.7	1.7	-0.2	-11.7
	4	West	Forest	2.2	1.8	1.7	1.7	-0.2	-10.6
	5	West	Forest	2.2	1.8	1.7	1.7	-0.2	-9.6
	7	West	Forest	2.1	1.7	1.6	1.6	-0.2	-8.2

	Distance from Road Edge (m)	Side of Road	Habitat [a]	Total Concentration (µg/m³)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
	10	West	Forest	2.0	1.7	1.6	1.6	-0.1	-6.6
	15	West	Forest	2.0	1.6	1.6	1.6	-0.1	-4.9
	20	West	Forest	1.9	1.6	1.5	1.5	-0.1	-3.9
	25	West	Forest	1.9	1.5	1.5	1.5	0.0	-3.2
	50	West	Forest	1.8	1.5	1.5	1.5	0.0	-1.5
	100	West	Forest	1.7	1.5	1.5	1.5	0.0	-0.6
	150	West	Forest	1.7	1.4	1.4	1.4	0.0	-0.3
	200	West	Forest	1.7	1.4	1.4	1.4	0.0	-0.2
A22/A275 Junction Transect	1	South	Forest	2.8	2.1	2.6	2.6	1.6	50.1
	2	South	Forest	2.7	2.1	2.5	2.5	1.4	43.8
	3	South	Forest	2.6	2.0	2.4	2.4	1.3	39.7
	4	South	Forest	2.6	2.0	2.3	2.3	1.2	36.8
	5	South	Forest	2.5	2.0	2.3	2.3	1.1	34.6
	7	South	Forest	2.5	1.9	2.3	2.3	1.1	32.8
	10	South	Forest	2.4	1.9	2.1	2.1	0.9	27.2
	15	South	Forest	2.4	1.8	2.1	2.1	0.8	24.4
	20	South	Forest	2.3	1.8	2.0	2.0	0.8	22.6
	25	South	Forest	2.3	1.8	2.0	2.0	0.7	21.1
	50	South	Forest	2.1	1.7	1.8	1.8	0.5	15.8
	100	South	Forest	2.0	1.6	1.7	1.7	0.4	10.5
	150	South	Forest	1.9	1.5	1.6	1.6	0.3	7.8
	200	South	Forest	1.8	1.5	1.6	1.6	0.2	6.1

	Distance from Road Edge (m)	Side of Road	Habitat [a]	Total Concentration (µg/m³)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
A22/A275 SouthJunction Transect	0	West	Forest	2.8	2.2	2.3	2.3	0.8	13.9
	1	West	Forest	2.6	2.1	2.2	2.2	0.7	12.5
	2	West	Forest	2.5	2.0	2.1	2.1	0.6	11.6
	3	West	Forest	2.5	1.9	2.0	2.1	0.6	11.0
	4	West	Forest	2.4	1.9	2.0	2.0	0.5	10.5
	5	West	Forest	2.4	1.9	2.0	2.0	0.5	10.1
	7	West	Forest	2.3	1.8	1.9	1.9	0.5	9.5
	10	West	Forest	2.2	1.8	1.8	1.8	0.4	9.0
	15	West	Forest	2.1	1.7	1.8	1.8	0.4	8.5
	20	West	Forest	2.1	1.7	1.7	1.7	0.3	8.5
	25	West	Forest	2.0	1.6	1.7	1.7	0.3	8.6
	50	West	Forest	2.0	1.6	1.7	1.7	0.4	12.5
	100	West	Forest	2.0	1.6	1.8	1.8	0.6	19.9
	150	West	Forest	1.8	1.5	1.5	1.5	0.2	4.5
	200	West	Forest	1.7	1.5	1.5	1.5	0.1	2.4

	Distance from Road Edge (m)	Side of Road	Habitat [a]	Total Concentration (µg/m³)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
A275 Transect	0	West	Mixed	2.5	2.0	2.6	2.6	1.9	63.3
	1	West	Mixed	2.4	1.9	2.4	2.4	1.5	51.1
	2	West	Mixed	2.3	1.8	2.2	2.2	1.3	43.6
	3	West	Mixed	2.2	1.8	2.1	2.1	1.1	38.3
	4	West	Mixed	2.1	1.7	2.1	2.1	1.0	34.2
	5	West	Mixed	2.1	1.7	2.0	2.0	0.9	30.8
	7	West	Mixed	2.0	1.7	1.9	1.9	0.8	25.8
	10	West	Mixed	2.0	1.6	1.8	1.8	0.6	20.6
	15	West	Mixed	1.9	1.6	1.7	1.7	0.5	15.3
	20	West	Mixed	1.9	1.5	1.7	1.7	0.4	12.1
	25	West	Mixed	1.8	1.5	1.6	1.6	0.3	9.9
	50	West	Mixed	1.7	1.5	1.5	1.5	0.2	5.0
	100	West	Mixed	1.7	1.5	1.5	1.5	0.1	2.3
	150	West	Mixed	1.7	1.4	1.5	1.5	0.0	1.5
	200	West	Mixed	1.7	1.4	1.5	1.5	0.0	1.0
	0	East	Grass	1.6	1.3	1.8	1.8	1.5	49.8
	1	East	Grass	1.5	1.2	1.6	1.6	1.2	41.1
	2	East	Grass	1.4	1.2	1.5	1.5	1.1	35.4
	3	East	Grass	1.4	1.2	1.4	1.4	0.9	31.0
	4	East	Grass	1.4	1.1	1.4	1.4	0.8	27.8
	5	East	Grass	1.3	1.1	1.3	1.3	0.8	25.3
	7	East	Grass	1.3	1.1	1.3	1.3	0.6	21.4
	10	East	Grass	1.2	1.0	1.2	1.2	0.5	17.3

Distance from Road Edge (m)		Side of Road	Habitat [a]	Total Concentration (µg/m³)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
	15	East	Grass	1.2	1.0	1.1	1.1	0.4	13.1
	20	East	Grass	1.2	1.0	1.1	1.1	0.3	10.5
	25	East	Grass	1.1	1.0	1.0	1.0	0.3	8.7
	50	East	Grass	1.1	0.9	1.0	1.0	0.1	4.7
	100	East	Grass	1.0	0.9	0.9	0.9	0.1	2.3
	150	East	Grass	1.0	0.9	0.9	0.9	0.0	1.5
	200	East	Grass	1.0	0.9	0.9	0.9	0.0	1.1
A22 (South Section) Receptor Transects									
West Wood Transect	0	West	Grass	1.6	1.3	1.4	1.4	0.4	6.2
West Wood Transect	1	West	Grass	1.6	1.3	1.3	1.3	0.4	5.4
West Wood Transect	2	West	Grass	1.5	1.2	1.3	1.3	0.3	4.8
West Wood Transect	3	West	Grass	1.5	1.2	1.2	1.2	0.3	4.3
West Wood Transect	4	West	Grass	1.4	1.2	1.2	1.2	0.3	3.9
West Wood Transect	5	West	Grass	1.4	1.1	1.2	1.2	0.3	3.6
West Wood Transect	7	West	Grass	1.3	1.1	1.1	1.1	0.2	3.1
West Wood Transect	10	West	Grass	1.3	1.1	1.1	1.1	0.2	2.5
West Wood Transect	15	West	Grass	1.2	1.0	1.0	1.0	0.1	1.9
West Wood Transect	20	West	Grass	1.2	1.0	1.0	1.0	0.1	1.6
West Wood Transect	25	West	Grass	1.2	1.0	1.0	1.0	0.1	1.3
West Wood Transect	50	West	Grass	1.1	0.9	0.9	0.9	0.0	0.7
West Wood Transect	100	West	Grass	1.1	0.9	0.9	0.9	0.0	0.4
West Wood Transect	150	West	Grass	1.0	0.9	0.9	0.9	0.0	0.3
West Wood Transect	200	West	Grass	1.0	0.9	0.9	0.9	0.0	0.2

Distance from Road Edge (m)		Side of Road	Habitat [a]	Total Concentration (µg/m^3)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
	0	East	Grass	2.0	1.6	1.7	1.7	0.7	9.7
	1	East	Grass	1.9	1.6	1.6	1.6	0.6	8.7
	2	East	Grass	1.8	1.5	1.5	1.6	0.5	7.8
	3	East	Grass	1.7	1.4	1.5	1.5	0.5	7.1
	4	East	Grass	1.7	1.4	1.4	1.4	0.5	6.5
	5	East	Grass	1.6	1.3	1.4	1.4	0.4	6.0
	7	East	Grass	1.6	1.3	1.3	1.3	0.4	5.2
	10	East	Grass	1.5	1.2	1.2	1.2	0.3	4.3
	15	East	Grass	1.4	1.1	1.2	1.2	0.2	3.4
	20	East	Grass	1.3	1.1	1.1	1.1	0.2	2.7
	25	East	Grass	1.3	1.0	1.1	1.1	0.2	2.3
	50	East	Grass	1.2	1.0	1.0	1.0	0.1	1.3
	100	East	Grass	1.1	0.9	0.9	0.9	0.0	0.7
	150	East	Grass	1.1	0.9	0.9	0.9	0.0	0.5
	200	East	Grass	1.0	0.9	0.9	0.9	0.0	0.3
Milbrook Farm Transect	0	West	Grass	1.6	1.3	1.4	1.4	0.4	5.6
	1	West	Grass	1.6	1.3	1.3	1.3	0.3	5.1
	2	West	Grass	1.5	1.2	1.3	1.3	0.3	4.6
	3	West	Grass	1.5	1.2	1.2	1.2	0.3	4.2
	4	West	Grass	1.4	1.2	1.2	1.2	0.3	3.9
	5	West	Grass	1.4	1.2	1.2	1.2	0.3	3.7
	10	West	Grass	1.3	1.1	1.1	1.1	0.2	2.7
	15	West	Grass	1.3	1.0	1.1	1.1	0.2	2.1

Distance from Road Edge (m)		Side of Road	Habitat [a]	Total Concentration (µg/m³)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
	20	West	Grass	1.2	1.0	1.0	1.0	0.1	1.8
	25	West	Grass	1.2	1.0	1.0	1.0	0.1	1.5
	50	West	Grass	1.1	0.9	0.9	0.9	0.1	0.8
	100	West	Grass	1.1	0.9	0.9	0.9	0.0	0.4
	150	West	Grass	1.0	0.9	0.9	0.9	0.0	0.3
	200	West	Grass	1.0	0.9	0.9	0.9	0.0	0.2
	0	East	Grass	2.0	1.6	1.7	1.7	0.7	9.6
	1	East	Grass	1.9	1.6	1.7	1.7	0.6	9.0
	2	East	Grass	1.9	1.5	1.6	1.6	0.6	8.3
	3	East	Grass	1.8	1.5	1.5	1.6	0.5	7.8
	4	East	Grass	1.8	1.4	1.5	1.5	0.5	7.3
	5	East	Grass	1.7	1.4	1.5	1.5	0.5	6.8
	10	East	Grass	1.6	1.3	1.3	1.3	0.4	5.1
	15	East	Grass	1.5	1.2	1.2	1.2	0.3	4.1
	20	East	Grass	1.4	1.1	1.2	1.2	0.2	3.4
	25	East	Grass	1.4	1.1	1.1	1.1	0.2	2.9
	50	East	Grass	1.2	1.0	1.0	1.0	0.1	1.6
	100	East	Grass	1.1	0.9	0.9	0.9	0.1	0.8
	150	East	Grass	1.1	0.9	0.9	0.9	0.0	0.5
	200	East	Grass	1.1	0.9	0.9	0.9	0.0	0.4

Distance from Road Edge (m)		Side of Road	Habitat [a]	Total Concentration (µg/m³)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
Little Birch Wood Transect	0	East	Forest	3.6	2.8	2.9	2.9	1.2	17.4
	1	East	Forest	3.4	2.6	2.8	2.8	1.0	15.4
	2	East	Forest	3.2	2.5	2.6	2.6	0.9	13.8
	3	East	Forest	3.1	2.4	2.5	2.5	0.9	12.5
	4	East	Forest	3.0	2.3	2.4	2.4	0.8	11.4
	5	East	Forest	2.9	2.2	2.3	2.3	0.7	10.5
	10	East	Forest	2.6	2.0	2.1	2.1	0.5	7.5
	15	East	Forest	2.4	1.9	1.9	1.9	0.4	5.8
	20	East	Forest	2.3	1.8	1.8	1.8	0.3	4.7
	25	East	Forest	2.2	1.7	1.8	1.8	0.3	4.0
	50	East	Forest	2.0	1.6	1.6	1.6	0.1	2.2
	100	East	Forest	1.8	1.5	1.5	1.5	0.1	1.2
	150	East	Forest	1.8	1.5	1.5	1.5	0.1	0.8
	200	East	Forest	1.7	1.5	1.5	1.5	0.0	0.6
A26 Receptor Transects									
Poplar Farm Transect	*0*	*West*	*Mixed*	*1.9*	*1.6*	*2.2*	*2.2*	*0.6*	*68.4*
	25	*West*	*Mixed*	*1.7*	*1.5*	*1.6*	*1.6*	*0.1*	*13.4*
	50	*West*	*Mixed*	*1.7*	*1.4*	*1.5*	*1.5*	*0.1*	*7.1*
	75	West	Mixed	1.7	1.4	1.5	1.5	0.0	4.7
	76	West	Mixed	1.7	1.4	1.5	1.5	0.0	4.6
	77	West	Mixed	1.7	1.4	1.5	1.5	0.0	4.6
	78	West	Mixed	1.7	1.4	1.5	1.5	0.0	4.5
	79	West	Mixed	1.7	1.4	1.5	1.5	0.0	4.4

Distance from Road Edge (m)		Side of Road	Habitat [a]	Total Concentration (µg/m^3)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
	80	West	Mixed	1.7	1.4	1.5	1.5	0.0	4.4
	82	West	Mixed	1.7	1.4	1.5	1.5	0.0	4.3
	85	West	Mixed	1.7	1.4	1.5	1.5	0.0	4.1
	90	West	Mixed	1.7	1.4	1.5	1.5	0.0	3.9
	95	West	Mixed	1.7	1.4	1.5	1.5	0.0	3.7
	100	West	Mixed	1.7	1.4	1.5	1.5	0.0	3.4
	105	West	Mixed	1.7	1.4	1.5	1.5	0.0	3.3
	130	West	Mixed	1.7	1.4	1.5	1.5	0.0	2.6
	155	West	Mixed	1.7	1.4	1.5	1.5	0.0	2.1
	180	West	Mixed	1.7	1.4	1.4	1.4	0.0	1.8
	200	West	Mixed	1.7	1.4	1.4	1.4	0.0	1.6
Owl House Transect	0	Northwest	Mixed	2.0	1.6	2.6	2.6	0.8	102.5
	1	Northwest	Mixed	1.9	1.6	2.4	2.4	0.7	87.1
	2	Northwest	Mixed	1.9	1.6	2.3	2.3	0.6	76.6
	3	Northwest	Mixed	1.9	1.6	2.2	2.2	0.6	68.5
	4	Northwest	Mixed	1.9	1.6	2.1	2.1	0.5	62.0
	5	Northwest	Mixed	1.8	1.5	2.1	2.1	0.5	56.6
	10	Northwest	Mixed	1.8	1.5	1.9	1.9	0.3	39.1
	15	Northwest	Mixed	1.8	1.5	1.8	1.8	0.3	29.4
	20	Northwest	Mixed	1.7	1.5	1.7	1.7	0.2	23.3
	25	Northwest	Mixed	1.7	1.5	1.6	1.6	0.1	19.1
	50	Northwest	Mixed	1.7	1.4	1.5	1.5	0.1	9.4
	100	Northwest	Mixed	1.7	1.4	1.5	1.5	0.0	4.1

Distance from Road Edge (m)		Side of Road	Habitat [a]	Total Concentration (µg/m³)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
	150	Northwest	Mixed	1.7	1.4	1.5	1.5	0.0	2.4
	200	Northwest	Mixed	1.7	1.4	1.4	1.4	0.0	1.6
Poundgate Transect	0	East	Mixed	1.9	1.6	2.5	2.5	0.7	89.4
	1	East	Mixed	1.9	1.6	2.3	2.3	0.7	78.4
	2	East	Mixed	1.9	1.6	2.2	2.2	0.6	70.1
	3	East	Mixed	1.9	1.6	2.2	2.2	0.5	63.5
	4	East	Mixed	1.8	1.5	2.1	2.1	0.5	58.1
	5	East	Mixed	1.8	1.5	2.0	2.0	0.4	53.5
	7	East	Mixed	1.8	1.5	2.0	2.0	0.4	46.1
	10	East	Mixed	1.8	1.5	1.9	1.9	0.3	38.2
	15	East	Mixed	1.7	1.5	1.8	1.8	0.3	29.5
	20	East	Mixed	1.7	1.5	1.7	1.7	0.2	24.0
	25	East	Mixed	1.7	1.5	1.7	1.7	0.2	20.2
	50	East	Mixed	1.7	1.4	1.6	1.6	0.1	11.2
	100	East	Mixed	1.7	1.4	1.5	1.5	0.1	5.9
	150	East	Mixed	1.7	1.4	1.5	1.5	0.0	4.0
	200	East	Mixed	1.7	1.4	1.5	1.5	0.0	3.0

[a] Where habitat is mixed (grass and forest), the deposition velocity for forest has been used which provides a worst-case assessment.

[b] Critical Level for Acid Deposition is 0.952 µg/m³.

A3 Mole Gap Full Model Results

NOx

Table A3.1: Model Results for NOx

	Distance from Road Edge (m)	Side of Road	Total Concentration (µg/m³)				% Change Relative of Critical Level [a]	
			2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
M25/A217 Receptor Transects								
M25 Transect	*0*	*South*	*84.8*	*28.5*	*35.0*	*35.5*	*1.6*	*23.1*
	10	*South*	*62.2*	*22.5*	*26.4*	*26.7*	*0.9*	*13.9*
	20	*South*	*53.6*	*20.2*	*23.1*	*23.3*	*0.7*	*10.4*
	30	*South*	*48.5*	*18.8*	*21.1*	*21.3*	*0.6*	*8.3*
	40	*South*	*45.1*	*17.9*	*19.8*	*20.0*	*0.5*	*6.9*
	50	*South*	*42.6*	*17.2*	*18.9*	*19.0*	*0.4*	*5.9*
	60	*South*	*40.8*	*16.7*	*18.2*	*18.3*	*0.4*	*5.2*
	63	South	40.3	16.6	18.0	18.1	0.3	5.0
	64	South	40.2	16.6	18.0	18.1	0.3	4.9
	65	South	40.0	16.5	17.9	18.0	0.3	4.9
	67	South	39.7	16.5	17.8	17.9	0.3	4.8
	68	South	39.6	16.4	17.7	17.8	0.3	4.7
	70	South	39.3	16.4	17.6	17.7	0.3	4.6
	73	South	39.0	16.3	17.5	17.6	0.3	4.5
	78	South	38.4	16.1	17.3	17.4	0.3	4.2
	83	South	37.9	16.0	17.1	17.2	0.3	4.0
	88	South	37.4	15.9	16.9	17.0	0.3	3.8

	Distance from Road Edge (m)	Side of Road	Total Concentration (µg/m³)				% Change Relative of Critical Level [a]	
			2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
	113	South	35.6	15.4	16.3	16.3	0.2	3.1
	163	South	33.5	14.8	15.5	15.5	0.2	2.3
	200	South	32.6	14.6	15.1	15.2	0.1	1.9
A217 Fox Lane Transect	0	North	65.7	21.0	27.6	28.2	2.0	23.9
	1	North	61.0	20.0	25.9	26.5	1.8	21.4
	2	North	57.5	19.3	24.7	25.2	1.6	19.5
	3	North	54.5	18.7	23.7	24.1	1.5	18.0
	4	North	52.2	18.3	22.9	23.3	1.4	16.8
	5	North	50.2	17.8	22.2	22.5	1.3	15.7
	10	North	43.1	16.4	19.7	20.0	1.0	12.0
	15	North	38.9	15.6	18.3	18.5	0.8	9.8
	20	North	36.0	15.0	17.3	17.5	0.7	8.3
	25	North	34.0	14.6	16.6	16.8	0.6	7.2
	50	North	38.6	16.5	17.7	17.8	0.4	4.5
	100	North	35.1	15.8	16.6	16.6	0.2	2.7
	150	North	33.8	15.6	16.1	16.2	0.2	2.0
	200	North	33.0	15.4	15.9	15.9	0.1	1.6

	Distance from Road Edge (m)	Side of Road	Total Concentration (µg/m³)				% Change Relative of Critical Level [a]	
			2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
A217 Fort Lodge Transect	*0*	*West*	*85.3*	*24.9*	*34.3*	*35.2*	*2.8*	*34.1*
	5	West	59.0	19.6	25.2	25.7	1.7	20.2
	6	West	56.6	19.1	24.3	24.8	1.6	19.0
	7	West	54.5	18.7	23.6	24.0	1.5	17.9
	8	West	52.8	18.3	23.0	23.4	1.4	16.9
	9	West	51.1	18.0	22.4	22.8	1.3	16.1
	10	West	49.6	17.7	21.9	22.3	1.3	15.3
	15	West	43.4	16.4	19.7	20.0	1.0	12.0
	20	West	39.4	15.6	18.3	18.6	0.8	9.9
	25	West	36.6	15.0	17.4	17.6	0.7	8.4
	30	West	34.5	14.6	16.6	16.8	0.6	7.3
	55	West	28.9	13.5	14.7	14.8	0.4	4.4
	100	West	25.4	12.8	13.5	13.6	0.2	2.6
	150	West	23.9	12.5	13.0	13.0	0.1	1.7
	200	West	23.1	12.4	12.7	12.8	0.1	1.3

	Distance from Road Edge (m)	Side of Road	Total Concentration (µg/m³)				% Change Relative of Critical Level [a]	
			2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
B2032 Receptor Transects								
B2032 Dawcombe Wood Transect	0	Southwest	22.1	12.1	13.4	13.4	0.1	4.4
	1	Southwest	20.9	11.8	12.9	12.9	0.1	3.7
	2	Southwest	20.2	11.6	12.6	12.6	0.0	3.3
	3	Southwest	19.7	11.5	12.4	12.4	0.0	3.0
	4	Southwest	19.3	11.4	12.2	12.2	0.0	2.8
	5	Southwest	18.9	11.3	12.1	12.1	0.0	2.6
	7	Southwest	18.4	11.2	11.8	11.8	0.0	2.2
	10	Southwest	17.8	11.0	11.6	11.6	0.0	1.9
	15	Southwest	17.2	10.9	11.3	11.3	0.0	1.6
	20	Southwest	16.8	10.8	11.2	11.2	0.0	1.3
	25	Southwest	16.5	10.7	11.0	11.0	0.0	1.2
	50	Southwest	15.8	10.5	10.7	10.7	0.0	0.8
	100	Southwest	15.3	10.4	10.5	10.5	0.0	0.5
	150	Southwest	15.2	10.3	10.5	10.5	0.0	0.4
	200	Southwest	15.1	10.3	10.4	10.4	0.0	0.4
	0	Northeast	26.4	13.2	15.3	15.3	0.1	6.9
	1	Northeast	24.4	12.7	14.4	14.4	0.1	5.7
	2	Northeast	23.2	12.4	13.9	13.9	0.1	5.0
	3	Northeast	22.4	12.2	13.5	13.6	0.1	4.6
	4	Northeast	21.8	12.0	13.3	13.3	0.1	4.2
	5	Northeast	21.3	11.9	13.0	13.1	0.1	3.9
	7	Northeast	20.6	11.7	12.8	12.8	0.1	3.5

Transect	Distance from Road Edge (m)	Side of Road	Total Concentration (µg/m³)				% Change Relative of Critical Level [a]	
			2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
	10	Northeast	19.9	11.5	12.5	12.5	0.0	3.1
	15	Northeast	18.9	11.3	12.1	12.1	0.0	2.6
	20	Northeast	18.3	11.1	11.8	11.8	0.0	2.2
	25	Northeast	17.8	11.0	11.6	11.6	0.0	1.9
	50	Northeast	16.5	10.7	11.0	11.0	0.0	1.2
	100	Northeast	15.8	10.5	10.7	10.7	0.0	0.7
	150	Northeast	15.5	10.4	10.6	10.6	0.0	0.6
	200	Northeast	15.3	10.4	10.5	10.5	0.0	0.5
B2032 Dawcombe Cottage Transect	0	West	23.9	12.6	14.2	14.2	0.1	5.4
	1	West	22.2	12.1	13.4	13.4	0.1	4.4
	2	West	21.2	11.9	13.0	13.1	0.1	3.9
	3	West	20.6	11.7	12.8	12.8	0.1	3.5
	4	West	20.1	11.6	12.6	12.6	0.1	3.2
	5	West	19.7	11.5	12.4	12.4	0.0	3.0
	7	West	19.1	11.3	12.1	12.1	0.0	2.6
	10	West	18.4	11.2	11.8	11.8	0.0	2.3
	15	West	17.7	11.0	11.5	11.5	0.0	1.8
	20	West	17.2	10.9	11.3	11.3	0.0	1.6
	25	West	16.9	10.8	11.2	11.2	0.0	1.4
	50	West	16.0	10.6	10.8	10.8	0.0	0.9
	100	West	15.4	10.4	10.6	10.6	0.0	0.6
	150	West	15.2	10.4	10.5	10.5	0.0	0.4
	200	West	15.1	10.3	10.4	10.4	0.0	0.4

Distance from Road Edge (m)	Side of Road	Total Concentration (µg/m³)				% Change Relative of Critical Level [a]	
		2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
0	East	24.8	12.8	14.5	14.6	0.1	5.9
1	East	23.7	12.5	14.1	14.1	0.1	5.3
2	East	22.9	12.3	13.7	13.8	0.1	4.8
3	East	22.2	12.2	13.5	13.5	0.1	4.4
4	East	21.7	12.0	13.2	13.3	0.1	4.1
5	East	21.3	11.9	13.1	13.1	0.1	3.9
7	East	20.6	11.7	12.8	12.8	0.1	3.5
10	East	19.8	11.5	12.4	12.4	0.0	3.1
15	East	18.9	11.3	12.0	12.1	0.0	2.5
20	East	18.3	11.1	11.8	11.8	0.0	2.2
25	East	17.9	11.0	11.6	11.6	0.0	1.9
50	East	16.7	10.7	11.1	11.1	0.0	1.3
100	East	15.9	10.5	10.8	10.8	0.0	0.8
150	East	15.5	10.4	10.6	10.6	0.0	0.6
200	East	15.3	10.4	10.5	10.5	0.0	0.5

	Distance from Road Edge (m)	Side of Road	Total Concentration (µg/m³)				% Change Relative of Critical Level [a]	
			2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
A24 Receptor Transects								
A24 Longbury Wood Transect	*0*	*North*	*45.2*	*16.1*	*18.8*	*18.8*	*0.0*	*8.8*
	20	*North*	*28.9*	*12.8*	*13.9*	*14.0*	*0.0*	*3.9*
	40	*North*	*24.3*	*11.9*	*12.6*	*12.6*	*0.0*	*2.5*
	60	*North*	*22.0*	*11.4*	*11.9*	*11.9*	*0.0*	*1.8*
	78	North	20.7	11.1	11.5	11.6	0.0	1.4
	79	North	20.7	11.1	11.5	11.5	0.0	1.4
	80	North	20.6	11.1	11.5	11.5	0.0	1.4
	81	North	20.6	11.1	11.5	11.5	0.0	1.4
	82	North	20.5	11.1	11.5	11.5	0.0	1.4
	83	North	20.4	11.1	11.5	11.5	0.0	1.4
	85	North	20.3	11.0	11.4	11.4	0.0	1.3
	88	North	20.2	11.0	11.4	11.4	0.0	1.3
	93	North	20.0	11.0	11.3	11.3	0.0	1.2
	98	North	19.7	10.9	11.3	11.3	0.0	1.1
	103	North	19.5	10.9	11.2	11.2	0.0	1.1
	108	North	19.4	10.8	11.1	11.1	0.0	1.0
	113	North	19.2	10.8	11.1	11.1	0.0	1.0
	138	North	18.5	10.7	10.9	10.9	0.0	0.8
	163	North	18.0	10.6	10.8	10.8	0.0	0.6
	200	North	17.6	10.5	10.6	10.6	0.0	0.5

	Distance from Road Edge (m)	Side of Road	Total Concentration (µg/m³)				% Change Relative of Critical Level [a]	
			2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
A24 Cowslip Lane Transect	*0*	*West*	*40.0*	*15.0*	*17.2*	*17.2*	*0.0*	*7.2*
	10	*West*	*28.5*	*12.7*	*13.8*	*13.8*	*0.0*	*3.7*
	20	*West*	*24.8*	*11.9*	*12.7*	*12.7*	*0.0*	*2.7*
	30	*West*	*22.8*	*11.5*	*12.2*	*12.2*	*0.0*	*2.1*
	40	*West*	*21.6*	*11.3*	*11.8*	*11.8*	*0.0*	*1.7*
	50	*West*	*20.7*	*11.1*	*11.5*	*11.5*	*0.0*	*1.4*
	60	West	20.1	11.0	11.4	11.4	0.0	1.2
	61	West	20.0	11.0	11.3	11.3	0.0	1.2
	62	West	20.0	11.0	11.3	11.3	0.0	1.2
	63	West	19.9	11.0	11.3	11.3	0.0	1.2
	64	West	19.9	10.9	11.3	11.3	0.0	1.2
	65	West	19.8	10.9	11.3	11.3	0.0	1.2
	67	West	19.7	10.9	11.3	11.3	0.0	1.1
	70	West	19.6	10.9	11.2	11.2	0.0	1.1
	75	West	19.4	10.9	11.2	11.2	0.0	1.0
	80	West	19.2	10.8	11.1	11.1	0.0	1.0
	100	West	18.7	10.7	11.0	11.0	0.0	0.8
	150	West	17.9	10.5	10.7	10.7	0.0	0.6
	200	West	17.4	10.4	10.6	10.6	0.0	0.4

	Distance from Road Edge (m)	Side of Road	Total Concentration (µg/m³)				% Change Relative of Critical Level [a]	
			2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
A24 Lodge Hill Transect	*0*	*East*	*82.5*	*23.4*	*28.6*	*28.6*	*0.1*	*17.4*
	20	*East*	*40.9*	*15.0*	*16.9*	*16.9*	*0.0*	*6.4*
	40	*East*	*30.2*	*12.8*	*13.9*	*13.9*	*0.0*	*3.6*
	60	*East*	*25.8*	*11.9*	*12.6*	*12.7*	*0.0*	*2.5*
	80	East	23.5	11.5	12.0	12.0	0.0	1.8
	81	East	23.4	11.4	12.0	12.0	0.0	1.8
	82	East	23.3	11.4	12.0	12.0	0.0	1.8
	83	East	23.3	11.4	11.9	11.9	0.0	1.8
	84	East	23.2	11.4	11.9	11.9	0.0	1.8
	85	East	23.1	11.4	11.9	11.9	0.0	1.7
	87	East	23.0	11.3	11.9	11.9	0.0	1.7
	90	East	22.8	11.3	11.8	11.8	0.0	1.6
	95	East	22.4	11.2	11.7	11.7	0.0	1.6
	100	East	22.1	11.2	11.6	11.6	0.0	1.5
	125	East	19.1	10.5	10.8	10.8	0.0	1.2
	150	East	18.3	10.3	10.6	10.6	0.0	1.0
	200	East	17.3	10.1	10.3	10.3	0.0	0.7

	Distance from Road Edge (m)	Side of Road	Total Concentration (µg/m³)				% Change Relative of Critical Level [a]	
			2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
A24 Box Hill Transect	*0*	*East*	*53.2*	*17.6*	*20.8*	*20.8*	*0.1*	*10.8*
	6	*East*	*39.7*	*14.8*	*16.8*	*16.8*	*0.0*	*6.8*
	12	East	34.3	13.7	15.2	15.2	0.0	5.2
	13	East	33.7	13.6	15.0	15.0	0.0	5.0
	14	East	33.1	13.4	14.9	14.9	0.0	4.8
	15	East	32.5	13.3	14.7	14.7	0.0	4.6
	16	East	32.0	13.2	14.5	14.6	0.0	4.5
	17	East	31.6	13.1	14.4	14.4	0.0	4.4
	19	East	30.7	12.9	14.1	14.2	0.0	4.1
	22	East	29.5	12.7	13.8	13.8	0.0	3.7
	27	East	27.9	12.4	13.3	13.3	0.0	3.3
	32	East	26.7	12.1	13.0	13.0	0.0	2.9
	37	East	25.7	11.9	12.7	12.7	0.0	2.6
	62	East	22.8	11.3	11.9	11.9	0.0	1.8
	112	East	20.4	10.8	11.1	11.1	0.0	1.0
	162	East	19.3	10.6	10.8	10.8	0.0	0.7
	200	East	18.7	10.5	10.7	10.7	0.0	0.6

[a] Critical Level for NOx is 30 µg/m³.

Ammonia

Table A3.2: Model Results for Ammonia

	Distance from Road Edge (m)	Side of Road	Habitat [a]	Total Concentration (µg/m^3)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
M25/A217 Receptor Transects									
M25 Transect	*0*	*South*	*Mixed*	*1.7*	*1.9*	*2.4*	*2.4*	*4.0*	*52.3*
M25 Transect	*10*	*South*	*Mixed*	*1.3*	*1.4*	*1.7*	*1.7*	*2.1*	*27.5*
M25 Transect	*20*	*South*	*Mixed*	*1.2*	*1.3*	*1.4*	*1.5*	*1.5*	*19.4*
M25 Transect	*30*	*South*	*Mixed*	*1.1*	*1.2*	*1.3*	*1.3*	*1.1*	*14.9*
M25 Transect	*40*	*South*	*Mixed*	*1.1*	*1.1*	*1.2*	*1.3*	*0.9*	*12.0*
M25 Transect	*50*	*South*	*Mixed*	*1.0*	*1.1*	*1.2*	*1.2*	*0.8*	*10.1*
M25 Transect	*60*	*South*	*Mixed*	*1.0*	*1.1*	*1.1*	*1.2*	*0.7*	*8.7*
M25 Transect	63	South	Mixed	1.0	1.1	1.1	1.1	0.6	8.3
M25 Transect	64	South	Mixed	1.0	1.1	1.1	1.1	0.6	8.2
M25 Transect	65	South	Mixed	1.0	1.1	1.1	1.1	0.6	8.1
M25 Transect	67	South	Mixed	1.0	1.0	1.1	1.1	0.6	7.9
M25 Transect	68	South	Mixed	1.0	1.0	1.1	1.1	0.6	7.8
M25 Transect	70	South	Mixed	1.0	1.0	1.1	1.1	0.6	7.6
M25 Transect	73	South	Mixed	1.0	1.0	1.1	1.1	0.6	7.3
M25 Transect	78	South	Mixed	1.0	1.0	1.1	1.1	0.5	6.9
M25 Transect	83	South	Mixed	1.0	1.0	1.1	1.1	0.5	6.5
M25 Transect	88	South	Mixed	1.0	1.0	1.1	1.1	0.5	6.2
M25 Transect	113	South	Mixed	1.0	1.0	1.0	1.0	0.4	4.9
M25 Transect	163	South	Mixed	1.0	1.0	1.0	1.0	0.3	3.5

	Distance from Road Edge (m)	Side of Road	Habitat [a]	Total Concentration (µg/m³)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
	200	South	Mixed	0.9	1.0	1.0	1.0	0.2	3.0
A217 Fox Lane Transect	0	North	Forest	1.8	2.1	3.0	3.1	7.4	96.1
	1	North	Forest	1.7	2.0	2.7	2.8	6.5	84.0
	2	North	Forest	1.6	1.8	2.5	2.6	5.8	75.1
	3	North	Forest	1.6	1.7	2.4	2.4	5.2	67.7
	4	North	Forest	1.5	1.7	2.2	2.3	4.8	62.0
	5	North	Forest	1.5	1.6	2.1	2.2	4.4	57.1
	10	North	Forest	1.3	1.4	1.8	1.8	3.1	40.6
	15	North	Forest	1.2	1.3	1.6	1.6	2.4	31.2
	20	North	Forest	1.2	1.2	1.4	1.5	1.9	25.2
	25	North	Forest	1.1	1.2	1.4	1.4	1.6	21.0
	50	North	Forest	1.0	1.0	1.1	1.2	0.9	11.3
	100	North	Forest	1.0	1.0	1.0	1.0	0.4	5.8
	150	North	Forest	0.9	0.9	1.0	1.0	0.3	3.8
	200	North	Forest	0.9	0.9	1.0	1.0	0.2	2.8
A217 Fort Lodge Transect	*0*	*West*	*Mixed*	*2.3*	*2.7*	*4.0*	*4.1*	*10.7*	*139.7*
	5	West	Mixed	1.6	1.8	2.5	2.5	5.5	71.6
	6	West	Mixed	1.5	1.7	2.3	2.4	5.0	65.7
	7	West	Mixed	1.5	1.7	2.2	2.3	4.7	60.7
	8	West	Mixed	1.5	1.6	2.1	2.2	4.4	56.6
	9	West	Mixed	1.4	1.6	2.1	2.1	4.1	52.8
	10	West	Mixed	1.4	1.5	2.0	2.0	3.8	49.3
	15	West	Mixed	1.3	1.3	1.7	1.7	2.8	35.7

	Distance from Road Edge (m)	Side of Road	Habitat [a]	Total Concentration (µg/m³)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
	20	West	Mixed	1.2	1.2	1.5	1.5	2.1	27.4
	25	West	Mixed	1.1	1.2	1.4	1.4	1.7	22.0
	30	West	Mixed	1.1	1.1	1.3	1.3	1.4	18.1
	55	West	Mixed	1.0	1.0	1.1	1.1	0.7	9.0
	100	West	Mixed	0.9	1.0	1.0	1.0	0.3	4.3
	150	West	Mixed	0.9	0.9	1.0	1.0	0.2	2.6
	200	West	Mixed	0.9	0.9	0.9	0.9	0.1	1.9
B2032 Receptor Transects									
B2032 Dawcombe Wood Transect	0	Southwest	Grass	1.1	1.1	1.3	1.3	0.3	16.3
	1	Southwest	Grass	1.1	1.1	1.2	1.2	0.3	13.4
	2	Southwest	Grass	1.0	1.1	1.2	1.2	0.2	11.7
	3	Southwest	Grass	1.0	1.1	1.2	1.2	0.2	10.4
	4	Southwest	Grass	1.0	1.0	1.1	1.1	0.2	9.4
	5	Southwest	Grass	1.0	1.0	1.1	1.1	0.2	8.6
	7	Southwest	Grass	1.0	1.0	1.1	1.1	0.2	7.3
	10	Southwest	Grass	1.0	1.0	1.0	1.0	0.1	6.0
	15	Southwest	Grass	1.0	1.0	1.0	1.0	0.1	4.6
	20	Southwest	Grass	0.9	1.0	1.0	1.0	0.1	3.8
	25	Southwest	Grass	0.9	0.9	1.0	1.0	0.1	3.1
	50	Southwest	Grass	0.9	0.9	0.9	0.9	0.0	1.7
	100	Southwest	Grass	0.9	0.9	0.9	0.9	0.0	0.9
	150	Southwest	Grass	0.9	0.9	0.9	0.9	0.0	0.6
	200	Southwest	Grass	0.9	0.9	0.9	0.9	0.0	0.5

Distance from Road Edge (m)	Side of Road	Habitat [a]	Total Concentration (µg/m³)				% Change Relative of Critical Level [b]	
			2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
0	Northeast	Grass	1.2	1.3	1.5	1.6	0.6	26.7
1	Northeast	Grass	1.1	1.2	1.4	1.4	0.4	21.4
2	Northeast	Grass	1.1	1.2	1.3	1.4	0.4	18.6
3	Northeast	Grass	1.1	1.1	1.3	1.3	0.3	16.5
4	Northeast	Grass	1.1	1.1	1.3	1.3	0.3	15.0
5	Northeast	Grass	1.1	1.1	1.2	1.2	0.3	13.6
7	Northeast	Grass	1.0	1.1	1.2	1.2	0.3	11.9
10	Northeast	Grass	1.0	1.0	1.1	1.1	0.2	10.2
15	Northeast	Grass	1.0	1.0	1.1	1.1	0.2	8.1
20	Northeast	Grass	1.0	1.0	1.1	1.1	0.1	6.7
25	Northeast	Grass	1.0	1.0	1.0	1.0	0.1	5.6
50	Northeast	Grass	0.9	0.9	1.0	1.0	0.1	2.9
100	Northeast	Grass	0.9	0.9	0.9	0.9	0.0	1.5
150	Northeast	Grass	0.9	0.9	0.9	0.9	0.0	1.0
200	Northeast	Grass	0.9	0.9	0.9	0.9	0.0	0.8

Distance from Road Edge (m)		Side of Road	Habitat [a]	Total Concentration (µg/m³)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
B2032 Dawcombe Cottage Transect	0	West	Grass	1.1	1.2	1.4	1.4	0.4	20.5
	1	West	Grass	1.1	1.1	1.3	1.3	0.3	16.0
	2	West	Grass	1.1	1.1	1.2	1.2	0.3	13.7
	3	West	Grass	1.0	1.1	1.2	1.2	0.3	12.2
	4	West	Grass	1.0	1.1	1.2	1.2	0.2	11.0
	5	West	Grass	1.0	1.0	1.1	1.1	0.2	10.0
	7	West	Grass	1.0	1.0	1.1	1.1	0.2	8.6
	10	West	Grass	1.0	1.0	1.1	1.1	0.2	7.0
	15	West	Grass	1.0	1.0	1.0	1.0	0.1	5.4
	20	West	Grass	1.0	1.0	1.0	1.0	0.1	4.4
	25	West	Grass	0.9	1.0	1.0	1.0	0.1	3.6
	50	West	Grass	0.9	0.9	0.9	0.9	0.0	2.0
	100	West	Grass	0.9	0.9	0.9	0.9	0.0	1.0
	150	West	Grass	0.9	0.9	0.9	0.9	0.0	0.7
	200	West	Grass	0.9	0.9	0.9	0.9	0.0	0.5
	0	East	Grass	1.2	1.2	1.4	1.4	0.5	21.9
	1	East	Grass	1.1	1.2	1.4	1.4	0.4	19.1
	2	East	Grass	1.1	1.1	1.3	1.3	0.4	17.1
	3	East	Grass	1.1	1.1	1.3	1.3	0.3	15.5
	4	East	Grass	1.1	1.1	1.2	1.2	0.3	14.2
	5	East	Grass	1.1	1.1	1.2	1.2	0.3	13.2
	7	East	Grass	1.0	1.1	1.2	1.2	0.2	11.5
	10	East	Grass	1.0	1.0	1.1	1.1	0.2	9.7

	Distance from Road Edge (m)	Side of Road	Habitat [a]	Total Concentration (µg/m³)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
	15	East	Grass	1.0	1.0	1.1	1.1	0.2	7.7
	20	East	Grass	1.0	1.0	1.1	1.1	0.1	6.3
	25	East	Grass	1.0	1.0	1.0	1.0	0.1	5.4
	50	East	Grass	0.9	0.9	1.0	1.0	0.1	3.0
	100	East	Grass	0.9	0.9	0.9	0.9	0.0	1.7
	150	East	Grass	0.9	0.9	0.9	0.9	0.0	1.0
	200	East	Grass	0.9	0.9	0.9	0.9	0.0	0.7
A24 Receptor Transects									
A24 Longbury Wood Transect	*0*	*North*	*Forest*	*1.5*	*1.7*	*2.0*	*2.0*	*0.1*	*30.7*
A24 Longbury Wood Transect	*20*	*North*	*Forest*	*1.1*	*1.2*	*1.3*	*1.3*	*0.0*	*10.9*
A24 Longbury Wood Transect	*40*	*North*	*Forest*	*1.0*	*1.1*	*1.1*	*1.1*	*0.0*	*6.5*
A24 Longbury Wood Transect	*60*	*North*	*Forest*	*1.0*	*1.0*	*1.1*	*1.1*	*0.0*	*4.4*
A24 Longbury Wood Transect	78	North	Forest	1.0	1.0	1.0	1.0	0.0	3.4
A24 Longbury Wood Transect	79	North	Forest	1.0	1.0	1.0	1.0	0.0	3.3
A24 Longbury Wood Transect	80	North	Forest	1.0	1.0	1.0	1.0	0.0	3.3
A24 Longbury Wood Transect	81	North	Forest	1.0	1.0	1.0	1.0	0.0	3.2
A24 Longbury Wood Transect	82	North	Forest	1.0	1.0	1.0	1.0	0.0	3.2
A24 Longbury Wood Transect	83	North	Forest	1.0	1.0	1.0	1.0	0.0	3.1
A24 Longbury Wood Transect	85	North	Forest	1.0	1.0	1.0	1.0	0.0	3.1
A24 Longbury Wood Transect	88	North	Forest	1.0	1.0	1.0	1.0	0.0	2.9
A24 Longbury Wood Transect	93	North	Forest	1.0	1.0	1.0	1.0	0.0	2.8
A24 Longbury Wood Transect	98	North	Forest	1.0	1.0	1.0	1.0	0.0	2.6
A24 Longbury Wood Transect	103	North	Forest	0.9	1.0	1.0	1.0	0.0	2.4

Distance from Road Edge (m)		Side of Road	Habitat [a]	Total Concentration (µg/m^3)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
	108	North	Forest	0.9	1.0	1.0	1.0	0.0	2.3
	113	North	Forest	0.9	1.0	1.0	1.0	0.0	2.2
	138	North	Forest	0.9	0.9	1.0	1.0	0.0	1.7
	163	North	Forest	0.9	0.9	0.9	0.9	0.0	1.3
	200	North	Forest	0.9	0.9	0.9	0.9	0.0	0.9
A24 Cowslip Lane Transect	*0*	*West*	*Forest*	*1.4*	*1.6*	*1.8*	*1.8*	*0.1*	*26.9*
	10	*West*	*Forest*	*1.1*	*1.2*	*1.3*	*1.3*	*0.0*	*11.9*
	20	*West*	*Forest*	*1.1*	*1.1*	*1.2*	*1.2*	*0.0*	*7.7*
	30	*West*	*Forest*	*1.0*	*1.0*	*1.1*	*1.1*	*0.0*	*5.6*
	40	*West*	*Forest*	*1.0*	*1.0*	*1.0*	*1.0*	*0.0*	*4.3*
	50	*West*	*Forest*	*1.0*	*1.0*	*1.0*	*1.0*	*0.0*	*3.5*
	60	West	Forest	1.0	1.0	1.0	1.0	0.0	2.9
	61	West	Forest	1.0	1.0	1.0	1.0	0.0	2.9
	62	West	Forest	1.0	1.0	1.0	1.0	0.0	2.8
	63	West	Forest	1.0	1.0	1.0	1.0	0.0	2.8
	64	West	Forest	1.0	1.0	1.0	1.0	0.0	2.8
	65	West	Forest	1.0	1.0	1.0	1.0	0.0	2.7
	67	West	Forest	1.0	1.0	1.0	1.0	0.0	2.6
	70	West	Forest	0.9	1.0	1.0	1.0	0.0	2.5
	75	West	Forest	0.9	1.0	1.0	1.0	0.0	2.3
	80	West	Forest	0.9	1.0	1.0	1.0	0.0	2.2
	100	West	Forest	0.9	0.9	1.0	1.0	0.0	1.7
	150	West	Forest	0.9	0.9	0.9	0.9	0.0	1.1

Distance from Road Edge (m)		Side of Road	Habitat [a]	Total Concentration (µg/m³)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
	200	West	Forest	0.9	0.9	0.9	0.9	0.0	0.8
A24 Lodge Hill Transect	*0*	*East*	*Mixed*	*1.7*	*1.9*	*2.3*	*2.3*	*0.2*	*39.3*
	20	*East*	*Mixed*	*1.1*	*1.2*	*1.3*	*1.3*	*0.0*	*12.0*
	40	*East*	*Mixed*	*1.0*	*1.1*	*1.1*	*1.1*	*0.0*	*6.2*
	60	*East*	*Mixed*	*1.0*	*1.0*	*1.0*	*1.0*	*0.0*	*4.0*
	80	East	Mixed	1.0	1.0	1.0	1.0	0.0	2.9
	81	East	Mixed	1.0	1.0	1.0	1.0	0.0	2.9
	82	East	Mixed	1.0	1.0	1.0	1.0	0.0	2.8
	83	East	Mixed	1.0	1.0	1.0	1.0	0.0	2.8
	84	East	Mixed	1.0	1.0	1.0	1.0	0.0	2.8
	85	East	Mixed	1.0	1.0	1.0	1.0	0.0	2.7
	87	East	Mixed	1.0	1.0	1.0	1.0	0.0	2.6
	90	East	Mixed	0.9	1.0	1.0	1.0	0.0	2.5
	95	East	Mixed	0.9	1.0	1.0	1.0	0.0	2.4
	100	East	Mixed	0.9	1.0	1.0	1.0	0.0	2.2
	125	East	Mixed	0.9	0.9	1.0	1.0	0.0	1.7
	150	East	Mixed	0.9	0.9	0.9	0.9	0.0	1.4
	200	East	Mixed	0.9	0.9	0.9	0.9	0.0	0.9

Distance from Road Edge (m)		Side of Road	Habitat [a]	Total Concentration (µg/m³)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
A24 Box Hill Transect	*0*	*East*	*Forest*	*1.7*	*1.9*	*2.3*	*2.3*	*0.2*	*39.2*
	6	*East*	*Forest*	*1.3*	*1.4*	*1.7*	*1.7*	*0.1*	*21.9*
	12	East	Forest	1.2	1.3	1.4	1.4	0.1	15.7
	13	East	Forest	1.2	1.3	1.4	1.4	0.1	15.0
	14	East	Forest	1.2	1.3	1.4	1.4	0.1	14.4
	15	East	Forest	1.2	1.2	1.4	1.4	0.1	13.8
	16	East	Forest	1.2	1.2	1.4	1.4	0.1	13.2
	17	East	Forest	1.1	1.2	1.3	1.3	0.1	12.7
	19	East	Forest	1.1	1.2	1.3	1.3	0.0	11.8
	22	East	Forest	1.1	1.2	1.3	1.3	0.0	10.5
	27	East	Forest	1.1	1.1	1.2	1.2	0.0	9.0
	32	East	Forest	1.1	1.1	1.2	1.2	0.0	7.8
	37	East	Forest	1.0	1.1	1.1	1.1	0.0	6.8
	62	East	Forest	1.0	1.0	1.0	1.0	0.0	4.2
	112	East	Forest	0.9	1.0	1.0	1.0	0.0	2.2
	162	East	Forest	0.9	0.9	0.9	0.9	0.0	1.3
	200	East	Forest	0.9	0.9	0.9	0.9	0.0	0.9

[a] Where habitat is mixed (grass and forest), the deposition velocity for forest has been used which provides a worst-case assessment.

[b] Critical Level for Ammonia is 1 µg/m³.

Nitrogen Deposition

Table A3.3: Model Results for Nitrogen Deposition

	Distance from Road Edge (m)	Side of Road	Habitat [a]	Total Concentration (µg/m³)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
M25/A217 Receptor Transects									
M25 Transect	0	South	Mixed	36.7	30.2	35.0	35.4	3.8	51.3
M25 Transect	10	South	Mixed	31.0	25.5	28.1	28.3	2.1	28.0
M25 Transect	20	South	Mixed	28.9	23.9	25.7	25.8	1.5	19.7
M25 Transect	30	South	Mixed	27.7	23.0	24.4	24.5	1.1	15.2
M25 Transect	40	South	Mixed	26.9	22.4	23.6	23.7	0.9	12.4
M25 Transect	50	South	Mixed	26.3	22.0	23.0	23.1	0.8	10.4
M25 Transect	60	South	Mixed	25.9	21.7	22.6	22.6	0.7	9.0
M25 Transect	63	South	Mixed	25.8	21.7	22.5	22.5	0.6	8.6
M25 Transect	64	South	Mixed	25.7	21.6	22.4	22.5	0.6	8.5
M25 Transect	65	South	Mixed	25.7	21.6	22.4	22.5	0.6	8.4
M25 Transect	67	South	Mixed	25.6	21.6	22.3	22.4	0.6	8.2
M25 Transect	68	South	Mixed	25.6	21.6	22.3	22.4	0.6	8.1
M25 Transect	70	South	Mixed	25.5	21.5	22.3	22.3	0.6	7.9
M25 Transect	73	South	Mixed	25.5	21.5	22.2	22.2	0.6	7.6
M25 Transect	78	South	Mixed	25.3	21.4	22.0	22.1	0.5	7.2
M25 Transect	83	South	Mixed	25.2	21.3	21.9	22.0	0.5	6.8
M25 Transect	88	South	Mixed	25.1	21.2	21.8	21.9	0.5	6.5
M25 Transect	113	South	Mixed	24.7	21.0	21.5	21.5	0.4	5.2
M25 Transect	163	South	Mixed	24.2	20.7	21.1	21.1	0.3	3.7

	Distance from Road Edge (m)	Side of Road	Habitat [a]	Total Concentration (µg/m³)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
	200	South	Mixed	24.0	20.6	20.9	20.9	0.3	3.2
A217 Fox Lane Transect	0	North	Forest	37.1	31.2	39.4	40.1	6.9	89.2
	1	North	Forest	35.6	29.8	37.0	37.6	6.1	78.1
	2	North	Forest	34.4	28.7	35.2	35.7	5.4	69.7
	3	North	Forest	33.4	27.9	33.7	34.1	4.9	62.8
	4	North	Forest	32.6	27.2	32.5	32.9	4.4	57.4
	5	North	Forest	31.9	26.6	31.5	31.9	4.1	52.8
	10	North	Forest	29.6	24.6	28.1	28.4	2.9	37.4
	15	North	Forest	28.2	23.6	26.2	26.4	2.2	28.7
	20	North	Forest	27.3	22.9	25.0	25.2	1.8	23.2
	25	North	Forest	26.7	22.4	24.2	24.3	1.5	19.4
	50	North	Forest	25.2	21.3	22.3	22.4	0.8	10.7
	100	North	Forest	24.3	20.7	21.2	21.3	0.5	5.6
	150	North	Forest	23.9	20.5	20.8	20.9	0.3	3.8
	200	North	Forest	23.7	20.4	20.6	20.6	0.2	2.9
A217 Fort Lodge Transect	*0*	*West*	*Mixed*	*43.1*	*36.7*	*48.8*	*49.8*	*10.1*	*131.4*
	5	West	Mixed	34.2	28.5	34.8	35.3	5.2	67.5
	6	West	Mixed	33.4	27.8	33.5	34.0	4.8	61.8
	7	West	Mixed	32.7	27.2	32.4	32.9	4.4	56.9
	8	West	Mixed	32.1	26.7	31.5	32.0	4.1	52.9
	9	West	Mixed	31.6	26.2	30.7	31.1	3.8	49.2
	10	West	Mixed	31.1	25.8	30.0	30.4	3.6	46.0
	15	West	Mixed	29.2	24.2	27.2	27.5	2.6	33.2

Distance from Road Edge (m)		Side of Road	Habitat [a]	Total Concentration (µg/m³)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
	20	West	Mixed	27.9	23.2	25.6	25.8	2.0	25.6
	25	West	Mixed	27.1	22.6	24.5	24.6	1.6	20.6
	30	West	Mixed	26.5	22.1	23.7	23.8	1.3	17.1
	55	West	Mixed	25.0	21.1	21.9	22.0	0.7	8.8
	100	West	Mixed	24.1	20.5	21.0	21.0	0.4	4.4
	150	West	Mixed	23.8	20.3	20.6	20.6	0.2	2.8
	200	West	Mixed	23.6	20.3	20.4	20.5	0.1	2.0
B2032 Receptor Transects									
B2032 Dawcombe Wood Transect	0	Southwest	Grass	15.6	13.6	14.5	14.5	0.2	9.6
	1	Southwest	Grass	15.3	13.3	14.1	14.1	0.2	8.0
	2	Southwest	Grass	15.2	13.2	13.9	13.9	0.1	7.0
	3	Southwest	Grass	15.1	13.1	13.7	13.7	0.1	6.2
	4	Southwest	Grass	15.0	13.0	13.5	13.5	0.1	5.7
	5	Southwest	Grass	14.9	12.9	13.4	13.4	0.1	5.1
	7	Southwest	Grass	14.8	12.8	13.2	13.2	0.1	4.4
	10	Southwest	Grass	14.6	12.7	13.0	13.0	0.1	3.6
	15	Southwest	Grass	14.5	12.6	12.8	12.8	0.1	2.7
	20	Southwest	Grass	14.4	12.5	12.7	12.7	0.0	2.3
	25	Southwest	Grass	14.4	12.4	12.6	12.6	0.0	1.9
	50	Southwest	Grass	14.2	12.3	12.4	12.4	0.0	1.1
	100	Southwest	Grass	14.1	12.2	12.3	12.3	0.0	0.6
	150	Southwest	Grass	14.1	12.2	12.3	12.3	0.0	0.4
	200	Southwest	Grass	14.1	12.2	12.2	12.2	0.0	0.3

Distance from Road Edge (m)	Side of Road	Habitat [a]	Total Concentration (µg/m^3)				% Change Relative of Critical Level [b]	
			2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
0	Northeast	Grass	16.5	14.4	15.8	15.9	0.3	15.1
1	Northeast	Grass	16.1	14.0	15.3	15.3	0.3	12.8
2	Northeast	Grass	15.8	13.8	14.9	14.9	0.2	11.1
3	Northeast	Grass	15.6	13.6	14.6	14.6	0.2	9.9
4	Northeast	Grass	15.5	13.5	14.3	14.4	0.2	8.9
5	Northeast	Grass	15.4	13.3	14.1	14.2	0.2	8.1
7	Northeast	Grass	15.2	13.2	13.9	13.9	0.1	7.1
10	Northeast	Grass	15.0	13.0	13.6	13.6	0.1	6.1
15	Northeast	Grass	14.8	12.9	13.3	13.3	0.1	4.8
20	Northeast	Grass	14.7	12.7	13.1	13.1	0.1	4.0
25	Northeast	Grass	14.6	12.6	13.0	13.0	0.1	3.3
50	Northeast	Grass	14.4	12.4	12.6	12.6	0.0	1.8
100	Northeast	Grass	14.2	12.3	12.4	12.4	0.0	0.9
150	Northeast	Grass	14.2	12.3	12.3	12.3	0.0	0.7
200	Northeast	Grass	14.1	12.2	12.3	12.3	0.0	0.5

	Distance from Road Edge (m)	Side of Road	Habitat [a]	Total Concentration (µg/m³)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
B2032 Dawcombe Cottage Transect	0	West	Grass	16.0	14.0	15.2	15.3	0.3	12.7
	1	West	Grass	15.7	13.7	14.7	14.7	0.2	10.3
	2	West	Grass	15.4	13.4	14.3	14.3	0.2	8.8
	3	West	Grass	15.3	13.3	14.0	14.1	0.2	7.7
	4	West	Grass	15.2	13.2	13.8	13.9	0.1	6.9
	5	West	Grass	15.1	13.1	13.7	13.7	0.1	6.3
	7	West	Grass	14.9	12.9	13.5	13.5	0.1	5.3
	10	West	Grass	14.8	12.8	13.2	13.2	0.1	4.3
	15	West	Grass	14.6	12.6	13.0	13.0	0.1	3.3
	20	West	Grass	14.5	12.5	12.8	12.8	0.1	2.6
	25	West	Grass	14.4	12.5	12.7	12.7	0.0	2.2
	50	West	Grass	14.3	12.3	12.5	12.5	0.0	1.2
	100	West	Grass	14.2	12.3	12.3	12.3	0.0	0.6
	150	West	Grass	14.1	12.2	12.3	12.3	0.0	0.4
	200	West	Grass	14.1	12.2	12.2	12.2	0.0	0.4
	0	East	Grass	16.3	14.2	15.6	15.6	0.3	14.1
	1	East	Grass	16.0	13.9	15.1	15.2	0.2	12.3
	2	East	Grass	15.8	13.7	14.8	14.8	0.2	10.9
	3	East	Grass	15.6	13.6	14.5	14.6	0.2	9.8
	4	East	Grass	15.5	13.5	14.3	14.3	0.2	8.9
	5	East	Grass	15.4	13.4	14.2	14.2	0.2	8.2
	7	East	Grass	15.2	13.2	13.9	13.9	0.2	7.1
	10	East	Grass	15.0	13.0	13.6	13.6	0.1	5.9

	Distance from Road Edge (m)	Side of Road	Habitat [a]	Total Concentration (µg/m^3)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
	15	East	Grass	14.8	12.8	13.3	13.3	0.1	4.6
	20	East	Grass	14.7	12.7	13.1	13.1	0.1	3.8
	25	East	Grass	14.6	12.6	12.9	13.0	0.1	3.2
	50	East	Grass	14.4	12.4	12.6	12.6	0.0	1.8
	100	East	Grass	14.2	12.3	12.4	12.4	0.0	1.0
	150	East	Grass	14.2	12.3	12.3	12.3	0.0	0.7
	200	East	Grass	14.1	12.2	12.3	12.3	0.0	0.5
A24 Receptor Transects									
A24 Longbury Wood Transect	*0*	*North*	*Forest*	*32.2*	*27.1*	*30.0*	*30.0*	*0.1*	*29.1*
	20	*North*	*Forest*	*26.6*	*22.4*	*23.4*	*23.4*	*0.1*	*10.2*
	40	*North*	*Forest*	*25.2*	*21.4*	*22.0*	*22.0*	*0.0*	*6.1*
	60	*North*	*Forest*	*24.6*	*21.0*	*21.4*	*21.4*	*0.0*	*4.2*
	78	North	Forest	24.2	20.7	21.1	21.1	0.0	3.2
	79	North	Forest	24.2	20.7	21.1	21.1	0.0	3.2
	80	North	Forest	24.2	20.7	21.0	21.0	0.0	3.2
	81	North	Forest	24.2	20.7	21.0	21.0	0.0	3.1
	82	North	Forest	24.2	20.7	21.0	21.0	0.0	3.1
	83	North	Forest	24.2	20.7	21.0	21.0	0.0	3.0
	85	North	Forest	24.1	20.7	21.0	21.0	0.0	3.0
	88	North	Forest	24.1	20.6	20.9	20.9	0.0	2.8
	93	North	Forest	24.0	20.6	20.9	20.9	0.0	2.7
	98	North	Forest	24.0	20.6	20.8	20.8	0.0	2.5
	103	North	Forest	23.9	20.5	20.8	20.8	0.0	2.4

Distance from Road Edge (m)		Side of Road	Habitat [a]	Total Concentration (µg/m³)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
	108	North	Forest	23.9	20.5	20.7	20.7	0.0	2.2
	113	North	Forest	23.8	20.5	20.7	20.7	0.0	2.1
	138	North	Forest	23.6	20.4	20.5	20.5	0.0	1.6
	163	North	Forest	23.5	20.3	20.4	20.4	0.0	1.3
	200	North	Forest	23.4	20.2	20.3	20.3	0.0	1.0
A24 Cowslip Lane Transect	*0*	*West*	*Forest*	*30.9*	*26.1*	*28.7*	*28.7*	*0.1*	*25.4*
	10	*West*	*Forest*	*26.7*	*22.7*	*23.8*	*23.8*	*0.1*	*11.2*
	20	*West*	*Forest*	*25.5*	*21.7*	*22.4*	*22.4*	*0.1*	*7.2*
	30	*West*	*Forest*	*24.9*	*21.2*	*21.7*	*21.7*	*0.0*	*5.2*
	40	*West*	*Forest*	*24.5*	*20.9*	*21.4*	*21.4*	*0.0*	*4.1*
	50	*West*	*Forest*	*24.3*	*20.8*	*21.1*	*21.1*	*0.0*	*3.3*
	60	West	Forest	24.1	20.6	20.9	20.9	0.0	2.8
	61	West	Forest	24.1	20.6	20.9	20.9	0.0	2.8
	62	West	Forest	24.0	20.6	20.9	20.9	0.0	2.7
	63	West	Forest	24.0	20.6	20.9	20.9	0.0	2.7
	64	West	Forest	24.0	20.6	20.9	20.9	0.0	2.7
	65	West	Forest	24.0	20.6	20.9	20.9	0.0	2.6
	67	West	Forest	24.0	20.6	20.8	20.8	0.0	2.5
	70	West	Forest	23.9	20.5	20.8	20.8	0.0	2.4
	75	West	Forest	23.9	20.5	20.7	20.7	0.0	2.3
	80	West	Forest	23.8	20.5	20.7	20.7	0.0	2.1
	100	West	Forest	23.7	20.4	20.5	20.5	0.0	1.7
	150	West	Forest	23.5	20.2	20.3	20.3	0.0	1.1

	Distance from Road Edge (m)	Side of Road	Habitat [a]	Total Concentration (µg/m³)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
	200	West	Forest	23.3	20.2	20.2	20.2	0.0	0.8
A24 Lodge Hill Transect	*0*	*East*	*Mixed*	*38.1*	*29.9*	*33.8*	*33.9*	*0.2*	*39.7*
	20	*East*	*Mixed*	*28.4*	*23.0*	*24.2*	*24.2*	*0.0*	*12.2*
	40	*East*	*Mixed*	*25.9*	*21.5*	*22.2*	*22.2*	*0.0*	*6.4*
	60	*East*	*Mixed*	*25.0*	*21.0*	*21.4*	*21.4*	*0.0*	*4.2*
	80	East	Mixed	24.5	20.7	21.0	21.0	0.0	3.1
	81	East	Mixed	24.4	20.7	21.0	21.0	0.0	3.0
	82	East	Mixed	24.4	20.7	21.0	21.0	0.0	3.0
	83	East	Mixed	24.4	20.7	21.0	21.0	0.0	2.9
	84	East	Mixed	24.4	20.7	21.0	21.0	0.0	2.9
	85	East	Mixed	24.4	20.7	21.0	21.0	0.0	2.9
	87	East	Mixed	24.3	20.7	20.9	20.9	0.0	2.8
	90	East	Mixed	24.3	20.6	20.9	20.9	0.0	2.7
	95	East	Mixed	24.2	20.6	20.8	20.8	0.0	2.5
	100	East	Mixed	24.1	20.6	20.8	20.8	0.0	2.4
	125	East	Mixed	23.9	20.4	20.6	20.6	0.0	1.8
	150	East	Mixed	23.7	20.3	20.5	20.5	0.0	1.5
	200	East	Mixed	23.5	20.2	20.3	20.3	0.0	1.1

	Distance from Road Edge (m)	Side of Road	Habitat [a]	Total Concentration (µg/m³)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
A24 Box Hill Transect	*0*	*East*	*Forest*	*34.5*	*29.0*	*32.7*	*32.7*	*0.2*	*36.9*
	6	*East*	*Forest*	*29.8*	*25.0*	*27.1*	*27.1*	*0.1*	*20.6*
	12	East	Forest	28.0	23.5	25.0	25.0	0.1	14.7
	13	East	Forest	27.8	23.4	24.8	24.8	0.1	14.0
	14	East	Forest	27.6	23.2	24.6	24.6	0.0	13.4
	15	East	Forest	27.5	23.1	24.4	24.4	0.1	12.8
	16	East	Forest	27.3	23.0	24.2	24.2	0.0	12.3
	17	East	Forest	27.1	22.8	24.0	24.0	0.0	11.8
	19	East	Forest	26.9	22.6	23.7	23.7	0.1	11.0
	22	East	Forest	26.5	22.4	23.3	23.3	0.0	9.8
	27	East	Forest	26.0	22.0	22.8	22.8	0.1	8.4
	32	East	Forest	25.7	21.7	22.5	22.5	0.1	7.3
	37	East	Forest	25.4	21.5	22.2	22.2	0.0	6.4
	62	East	Forest	24.5	20.9	21.3	21.3	0.0	4.0
	112	East	Forest	23.9	20.5	20.7	20.7	0.0	2.1
	162	East	Forest	23.6	20.3	20.4	20.4	0.0	1.3
	200	East	Forest	23.4	20.2	20.3	20.3	0.0	1.0

[a] Where habitat is mixed (grass and forest), the deposition velocity for forest has been used which provides a worst-case assessment.

[b] Critical Level for NDep is 10 µg/m³.

Acid Deposition

Table A3.4: Model Results for Acid Deposition

	Distance from Road Edge (m)	Side of Road	Habitat [a]	Total Concentration (µg/m³)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
M25/A217 Receptor Transects									
M25 Transect	*0*	*South*	*Mixed*	*2.6*	*2.2*	*2.5*	*2.5*	*1.9*	*25.3*
M25 Transect	*10*	*South*	*Mixed*	*2.2*	*1.8*	*2.0*	*2.0*	*1.0*	*13.8*
M25 Transect	*20*	*South*	*Mixed*	*2.1*	*1.7*	*1.8*	*1.8*	*0.7*	*9.7*
M25 Transect	*30*	*South*	*Mixed*	*2.0*	*1.6*	*1.7*	*1.8*	*0.6*	*7.5*
M25 Transect	*40*	*South*	*Mixed*	*1.9*	*1.6*	*1.7*	*1.7*	*0.5*	*6.1*
M25 Transect	*50*	*South*	*Mixed*	*1.9*	*1.6*	*1.6*	*1.6*	*0.4*	*5.1*
M25 Transect	*60*	*South*	*Mixed*	*1.8*	*1.6*	*1.6*	*1.6*	*0.3*	*4.4*
M25 Transect	63	South	Mixed	1.8	1.5	1.6	1.6	0.3	4.3
M25 Transect	64	South	Mixed	1.8	1.5	1.6	1.6	0.3	4.2
M25 Transect	65	South	Mixed	1.8	1.5	1.6	1.6	0.3	4.1
M25 Transect	67	South	Mixed	1.8	1.5	1.6	1.6	0.3	4.0
M25 Transect	68	South	Mixed	1.8	1.5	1.6	1.6	0.3	4.0
M25 Transect	70	South	Mixed	1.8	1.5	1.6	1.6	0.3	3.9
M25 Transect	73	South	Mixed	1.8	1.5	1.6	1.6	0.3	3.8
M25 Transect	78	South	Mixed	1.8	1.5	1.6	1.6	0.3	3.6
M25 Transect	83	South	Mixed	1.8	1.5	1.6	1.6	0.2	3.4
M25 Transect	88	South	Mixed	1.8	1.5	1.6	1.6	0.2	3.2
M25 Transect	113	South	Mixed	1.8	1.5	1.5	1.5	0.2	2.6
M25 Transect	163	South	Mixed	1.7	1.5	1.5	1.5	0.1	1.8

	Distance from Road Edge (m)	Side of Road	Habitat [a]	Total Concentration (µg/m³)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
	200	South	Mixed	1.7	1.5	1.5	1.5	0.1	1.6
A217 Fox Lane Transect	0	North	Forest	2.7	2.2	2.8	2.9	3.4	44.0
A217 Fox Lane Transect	1	North	Forest	2.5	2.1	2.6	2.7	3.0	38.5
A217 Fox Lane Transect	2	North	Forest	2.5	2.1	2.5	2.6	2.7	34.4
A217 Fox Lane Transect	3	North	Forest	2.4	2.0	2.4	2.4	2.4	31.0
A217 Fox Lane Transect	4	North	Forest	2.3	1.9	2.3	2.4	2.2	28.3
A217 Fox Lane Transect	5	North	Forest	2.3	1.9	2.2	2.3	2.0	26.0
A217 Fox Lane Transect	10	North	Forest	2.1	1.8	2.0	2.0	1.4	18.4
A217 Fox Lane Transect	15	North	Forest	2.0	1.7	1.9	1.9	1.1	14.2
A217 Fox Lane Transect	20	North	Forest	2.0	1.6	1.8	1.8	0.9	11.4
A217 Fox Lane Transect	25	North	Forest	1.9	1.6	1.7	1.7	0.8	9.6
A217 Fox Lane Transect	50	North	Forest	1.8	1.5	1.6	1.6	0.4	5.3
A217 Fox Lane Transect	100	North	Forest	1.7	1.5	1.5	1.5	0.2	2.8
A217 Fox Lane Transect	150	North	Forest	1.7	1.5	1.5	1.5	0.2	1.9
A217 Fox Lane Transect	200	North	Forest	1.7	1.5	1.5	1.5	0.1	1.4
A217 Fort Lodge Transect	*0*	*West*	*Mixed*	*3.1*	*2.6*	*3.5*	*3.6*	*5.0*	*64.8*
A217 Fort Lodge Transect	5	West	Mixed	2.4	2.0	2.5	2.5	2.6	33.3
A217 Fort Lodge Transect	6	West	Mixed	2.4	2.0	2.4	2.4	2.4	30.4
A217 Fort Lodge Transect	7	West	Mixed	2.3	1.9	2.3	2.3	2.2	28.1
A217 Fort Lodge Transect	8	West	Mixed	2.3	1.9	2.3	2.3	2.0	26.1
A217 Fort Lodge Transect	9	West	Mixed	2.3	1.9	2.2	2.2	1.9	24.3
A217 Fort Lodge Transect	10	West	Mixed	2.2	1.8	2.1	2.2	1.8	22.7
A217 Fort Lodge Transect	15	West	Mixed	2.1	1.7	1.9	2.0	1.3	16.4

	Distance from Road Edge (m)	Side of Road	Habitat [a]	Total Concentration (µg/m³)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
	20	West	Mixed	2.0	1.7	1.8	1.8	1.0	12.6
	25	West	Mixed	1.9	1.6	1.7	1.8	0.8	10.2
	30	West	Mixed	1.9	1.6	1.7	1.7	0.7	8.4
	55	West	Mixed	1.8	1.5	1.6	1.6	0.3	4.3
	100	West	Mixed	1.7	1.5	1.5	1.5	0.2	2.2
	150	West	Mixed	1.7	1.5	1.5	1.5	0.1	1.4
	200	West	Mixed	1.7	1.4	1.5	1.5	0.1	1.0
B2032 Receptor Transects									
B2032 Dawcombe Wood Transect	0	Southwest	Grass	1.1	1.0	1.0	1.0	0.1	4.8
	1	Southwest	Grass	1.1	1.0	1.0	1.0	0.1	4.0
	2	Southwest	Grass	1.1	0.9	1.0	1.0	0.1	3.4
	3	Southwest	Grass	1.1	0.9	1.0	1.0	0.1	3.1
	4	Southwest	Grass	1.1	0.9	1.0	1.0	0.1	2.8
	5	Southwest	Grass	1.1	0.9	1.0	1.0	0.1	2.5
	7	Southwest	Grass	1.1	0.9	0.9	0.9	0.1	2.2
	10	Southwest	Grass	1.1	0.9	0.9	0.9	0.0	1.8
	15	Southwest	Grass	1.0	0.9	0.9	0.9	0.0	1.4
	20	Southwest	Grass	1.0	0.9	0.9	0.9	0.0	1.1
	25	Southwest	Grass	1.0	0.9	0.9	0.9	0.0	0.9
	50	Southwest	Grass	1.0	0.9	0.9	0.9	0.0	0.5
	100	Southwest	Grass	1.0	0.9	0.9	0.9	0.0	0.3
	150	Southwest	Grass	1.0	0.9	0.9	0.9	0.0	0.2
	200	Southwest	Grass	1.0	0.9	0.9	0.9	0.0	0.2

Distance from Road Edge (m)	Side of Road	Habitat [a]	Total Concentration (µg/m^3)				% Change Relative of Critical Level [b]	
			2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
0	Northeast	Grass	1.2	1.0	1.1	1.1	0.2	7.5
1	Northeast	Grass	1.2	1.0	1.1	1.1	0.1	6.3
2	Northeast	Grass	1.1	1.0	1.1	1.1	0.1	5.5
3	Northeast	Grass	1.1	1.0	1.0	1.0	0.1	4.9
4	Northeast	Grass	1.1	1.0	1.0	1.0	0.1	4.4
5	Northeast	Grass	1.1	1.0	1.0	1.0	0.1	4.0
7	Northeast	Grass	1.1	0.9	1.0	1.0	0.1	3.5
10	Northeast	Grass	1.1	0.9	1.0	1.0	0.1	3.0
15	Northeast	Grass	1.1	0.9	1.0	1.0	0.0	2.4
20	Northeast	Grass	1.1	0.9	0.9	0.9	0.0	2.0
25	Northeast	Grass	1.0	0.9	0.9	0.9	0.0	1.6
50	Northeast	Grass	1.0	0.9	0.9	0.9	0.0	0.9
100	Northeast	Grass	1.0	0.9	0.9	0.9	0.0	0.5
150	Northeast	Grass	1.0	0.9	0.9	0.9	0.0	0.3
200	Northeast	Grass	1.0	0.9	0.9	0.9	0.0	0.3

	Distance from Road Edge (m)	Side of Road	Habitat [a]	Total Concentration (µg/m³)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
B2032 Dawcombe Cottage Transect	0	West	Grass	1.2	1.0	1.1	1.1	0.1	6.2
	1	West	Grass	1.1	1.0	1.1	1.1	0.1	5.1
	2	West	Grass	1.1	1.0	1.0	1.0	0.1	4.3
	3	West	Grass	1.1	1.0	1.0	1.0	0.1	3.8
	4	West	Grass	1.1	0.9	1.0	1.0	0.1	3.4
	5	West	Grass	1.1	0.9	1.0	1.0	0.1	3.1
	7	West	Grass	1.1	0.9	1.0	1.0	0.1	2.6
	10	West	Grass	1.1	0.9	0.9	0.9	0.1	2.1
	15	West	Grass	1.0	0.9	0.9	0.9	0.0	1.6
	20	West	Grass	1.0	0.9	0.9	0.9	0.0	1.3
	25	West	Grass	1.0	0.9	0.9	0.9	0.0	1.1
	50	West	Grass	1.0	0.9	0.9	0.9	0.0	0.6
	100	West	Grass	1.0	0.9	0.9	0.9	0.0	0.3
	150	West	Grass	1.0	0.9	0.9	0.9	0.0	0.2
	200	West	Grass	1.0	0.9	0.9	0.9	0.0	0.2
	0	East	Grass	1.2	1.0	1.1	1.1	0.1	7.0
	1	East	Grass	1.1	1.0	1.1	1.1	0.1	6.0
	2	East	Grass	1.1	1.0	1.1	1.1	0.1	5.4
	3	East	Grass	1.1	1.0	1.0	1.0	0.1	4.8
	4	East	Grass	1.1	1.0	1.0	1.0	0.1	4.4
	5	East	Grass	1.1	1.0	1.0	1.0	0.1	4.0
	7	East	Grass	1.1	0.9	1.0	1.0	0.1	3.5
	10	East	Grass	1.1	0.9	1.0	1.0	0.1	2.9

Distance from Road Edge (m)		Side of Road	Habitat [a]	Total Concentration (µg/m³)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
	15	East	Grass	1.1	0.9	1.0	1.0	0.1	2.3
	20	East	Grass	1.1	0.9	0.9	0.9	0.0	1.9
	25	East	Grass	1.0	0.9	0.9	0.9	0.0	1.6
	50	East	Grass	1.0	0.9	0.9	0.9	0.0	0.9
	100	East	Grass	1.0	0.9	0.9	0.9	0.0	0.5
	150	East	Grass	1.0	0.9	0.9	0.9	0.0	0.3
	200	East	Grass	1.0	0.9	0.9	0.9	0.0	0.2
A24 Receptor Transects									
A24 Longbury Wood Transect	*0*	*North*	*Forest*	*2.3*	*1.9*	*2.1*	*2.1*	*0.1*	*14.4*
	20	*North*	*Forest*	*1.9*	*1.6*	*1.7*	*1.7*	*0.0*	*5.0*
	40	*North*	*Forest*	*1.8*	*1.5*	*1.6*	*1.6*	*0.0*	*3.0*
	60	*North*	*Forest*	*1.8*	*1.5*	*1.5*	*1.5*	*0.0*	*2.1*
	78	North	Forest	1.7	1.5	1.5	1.5	0.0	1.6
	79	North	Forest	1.7	1.5	1.5	1.5	0.0	1.6
	80	North	Forest	1.7	1.5	1.5	1.5	0.0	1.6
	81	North	Forest	1.7	1.5	1.5	1.5	0.0	1.5
	82	North	Forest	1.7	1.5	1.5	1.5	0.0	1.5
	83	North	Forest	1.7	1.5	1.5	1.5	0.0	1.5
	85	North	Forest	1.7	1.5	1.5	1.5	0.0	1.5
	88	North	Forest	1.7	1.5	1.5	1.5	0.0	1.4
	93	North	Forest	1.7	1.5	1.5	1.5	0.0	1.3
	98	North	Forest	1.7	1.5	1.5	1.5	0.0	1.2
	103	North	Forest	1.7	1.5	1.5	1.5	0.0	1.2

	Distance from Road Edge (m)	Side of Road	Habitat [a]	Total Concentration (µg/m³)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
	108	North	Forest	1.7	1.5	1.5	1.5	0.0	1.1
	113	North	Forest	1.7	1.5	1.5	1.5	0.0	1.0
	138	North	Forest	1.7	1.5	1.5	1.5	0.0	0.8
	163	North	Forest	1.7	1.4	1.5	1.5	0.0	0.6
	200	North	Forest	1.7	1.4	1.4	1.4	0.0	0.5
A24 Cowslip Lane Transect	*0*	*West*	*Forest*	*2.2*	*1.9*	*2.0*	*2.0*	*0.0*	*12.5*
	10	*West*	*Forest*	*1.9*	*1.6*	*1.7*	*1.7*	*0.0*	*5.5*
	20	*West*	*Forest*	*1.8*	*1.6*	*1.6*	*1.6*	*0.0*	*3.5*
	30	*West*	*Forest*	*1.8*	*1.5*	*1.6*	*1.6*	*0.0*	*2.6*
	40	*West*	*Forest*	*1.8*	*1.5*	*1.5*	*1.5*	*0.0*	*2.0*
	50	*West*	*Forest*	*1.7*	*1.5*	*1.5*	*1.5*	*0.0*	*1.6*
	60	West	Forest	1.7	1.5	1.5	1.5	0.0	1.4
	61	West	Forest	1.7	1.5	1.5	1.5	0.0	1.4
	62	West	Forest	1.7	1.5	1.5	1.5	0.0	1.3
	63	West	Forest	1.7	1.5	1.5	1.5	0.0	1.3
	64	West	Forest	1.7	1.5	1.5	1.5	0.0	1.3
	65	West	Forest	1.7	1.5	1.5	1.5	0.0	1.3
	67	West	Forest	1.7	1.5	1.5	1.5	0.0	1.2
	70	West	Forest	1.7	1.5	1.5	1.5	0.0	1.2
	75	West	Forest	1.7	1.5	1.5	1.5	0.0	1.1
	80	West	Forest	1.7	1.5	1.5	1.5	0.0	1.0
	100	West	Forest	1.7	1.5	1.5	1.5	0.0	0.8
	150	West	Forest	1.7	1.4	1.5	1.5	0.0	0.5

	Distance from Road Edge (m)	Side of Road	Habitat [a]	Total Concentration (µg/m³)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
	200	West	Forest	1.7	1.4	1.4	1.4	0.0	0.4
A24 Lodge Hill Transect	*0*	*East*	*Mixed*	*2.7*	*2.1*	*2.4*	*2.4*	*0.1*	*19.6*
	20	*East*	*Mixed*	*2.0*	*1.6*	*1.7*	*1.7*	*0.0*	*6.0*
	40	*East*	*Mixed*	*1.9*	*1.5*	*1.6*	*1.6*	*0.0*	*3.2*
	60	*East*	*Mixed*	*1.8*	*1.5*	*1.5*	*1.5*	*0.0*	*2.1*
	80	East	Mixed	1.7	1.5	1.5	1.5	0.0	1.5
	81	East	Mixed	1.7	1.5	1.5	1.5	0.0	1.5
	82	East	Mixed	1.7	1.5	1.5	1.5	0.0	1.5
	83	East	Mixed	1.7	1.5	1.5	1.5	0.0	1.5
	84	East	Mixed	1.7	1.5	1.5	1.5	0.0	1.4
	85	East	Mixed	1.7	1.5	1.5	1.5	0.0	1.4
	87	East	Mixed	1.7	1.5	1.5	1.5	0.0	1.4
	90	East	Mixed	1.7	1.5	1.5	1.5	0.0	1.3
	95	East	Mixed	1.7	1.5	1.5	1.5	0.0	1.2
	100	East	Mixed	1.7	1.5	1.5	1.5	0.0	1.2
	125	East	Mixed	1.7	1.5	1.5	1.5	0.0	0.9
	150	East	Mixed	1.7	1.5	1.5	1.5	0.0	0.7
	200	East	Mixed	1.7	1.4	1.5	1.5	0.0	0.5

	Distance from Road Edge (m)	Side of Road	Habitat [a]	Total Concentration (µg/m³)				% Change Relative of Critical Level [b]	
				2015 Baseline	2035 Do Nothing	2035 Do Minimum	2035 Do Something	2035 In-Isolation	2035 In-Combination
A24 Box Hill Transect	0	East	Forest	2.5	2.1	2.3	2.3	0.1	18.2
	6	East	Forest	2.1	1.8	1.9	1.9	0.0	10.2
	12	East	Forest	2.0	1.7	1.8	1.8	0.0	7.2
	13	East	Forest	2.0	1.7	1.8	1.8	0.0	6.9
	14	East	Forest	2.0	1.7	1.8	1.8	0.0	6.6
	15	East	Forest	2.0	1.6	1.7	1.7	0.0	6.3
	16	East	Forest	1.9	1.6	1.7	1.7	0.0	6.1
	17	East	Forest	1.9	1.6	1.7	1.7	0.0	5.8
	19	East	Forest	1.9	1.6	1.7	1.7	0.0	5.4
	22	East	Forest	1.9	1.6	1.7	1.7	0.0	4.8
	27	East	Forest	1.9	1.6	1.6	1.6	0.0	4.1
	32	East	Forest	1.8	1.6	1.6	1.6	0.0	3.6
	37	East	Forest	1.8	1.5	1.6	1.6	0.0	3.2
	62	East	Forest	1.8	1.5	1.5	1.5	0.0	2.0
	112	East	Forest	1.7	1.5	1.5	1.5	0.0	1.0
	162	East	Forest	1.7	1.4	1.5	1.5	0.0	0.6
	200	East	Forest	1.7	1.4	1.4	1.4	0.0	0.5

[a] Where habitat is mixed (grass and forest), the deposition velocity for forest has been used which provides a worst-case assessment.

[b] Critical Level for ADep is 1.449 µg/m³.

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Appendix E: Screening of Air Quality Modelling Data

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1 Introduction

1.1 Background

1.1.1 This appendix has been prepared to support the Crawley Local Plan Habitats Regulations Assessment (HRA) and should be read in conjunction with this report[1].

1.1.2 Natural England has developed a standard methodology for the assessment of traffic related air quality impacts under the Habitats Regulations which is relevant to the HRA of land use plans[2]. This methodology has been followed in the HRA of the Crawley Local Plan to scope and screen likely significant air quality effects from the Local Plan at Habitats sites. The assessment focuses on Mole Gap to Reigate Escarpment SAC and Ashdown Forest SAC and SPA.

1.1.3 Natural England's advice notes that an assessment of the risks from road traffic emissions can be expressed in terms of the average annual daily traffic flow (AADT) as a proxy for emissions. The use of the AADT screening threshold is advocated by Highways England in their Design Manual for Roads and Bridges (DMRB). This screening threshold is intended to be used as a guide to determine whether a more detailed assessment of the impact of emissions from road traffic is required. This non-statutory, or guideline threshold, is based on a predicted change of daily traffic flows of 1,000 AADT or more (or a change in heavy-duty vehicle (HDV) flows on motorways of 200 AADT or more).

1.1.4 A review of traffic data prepared in support of the Local Plan indicates that there is an exceedance of the 1,000 AADT screening threshold (alone and / or in-combination) on a number of road links within 200m of the Mole Gap to Reigate Escarpment SAC and Ashdown Forest SAC and SPA. This assessment is presented in the main HRA report.

1.1.5 As noted in Natural England[3] and the Chartered Institute of Ecology and Environmental Management's (CIEEM)[4] guidance on the assessment of air quality at designated sites, AADT thresholds do not themselves imply any intrinsic environmental effects, instead being used solely as a trigger for further investigation in the HRA process.

[1] Lepus Consulting, January 2023. Habitats Regulations Assessment of the Crawley Borough Council Local Plan. Submission Publication Consultation. Habitats Regulations Assessment Report.

[2] Natural England (2018) Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations (NEA001). Available at: http://publications.naturalengland.org.uk/publication/4720542048845824 [Date Accessed: 14/12/22]

[3] Natural England (2018) Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations (NEA001). Available at: http://publications.naturalengland.org.uk/publication/4720542048845824 [Date Accessed: 02/02/21]

[4] CIEEM. January 2021. Advisory Note: Ecological Assessment of Air Quality Impacts

1.1.6 Given the exceedances identified, air quality modelling was therefore commissioned to better define air quality impacts. This modelling is reported upon in Air Quality Consultants (AQC) Crawley Borough Council Air Quality Assessment Report[5] (referred to hereafter as the Air Quality Report (AQR)) – Appendix D.

1.1.7 Appendix A2 and A3 of the AQR, provide the outputs of the results against the 1% screening threshold. These results are summarised and interpreted in an ecological screening assessment presented in this appendix.

[5] Air Quality Consultants. April 2021. Crawley Borough Council Local Plan Air Quality Assessment.

2 Ashdown Forest SPA and SAC Screening

2.1 Nitrogen Oxides

2.1.1 Appendix A2 of the AQR report shows that in-isolation contributions to NOx concentrations are largely below 1% of the critical level in 2035, with the exception of a number of receptors within 4m of the A22/A275 Junction transect, and within 2m of the A275 transect. The maximum in-isolation contribution is 1.6% (0.5 $\mu g/m^3$) of the critical level at the immediate road edge of the A275.

2.1.2 Using the 1% screening threshold as a benchmark to screen for LSEs it can be seen that effects alone can be screened out for all road links with the exception of the A22/A275 and A275 transects where LSEs alone are screened in for further consideration in the HRA Appropriate Assessment process. Given there is no alone exceedance of thresholds at all other receptor transects it is necessary to next consider effects in-combination at these links.

2.1.3 With the exception of the northern section of the A22, where there is a forecast decrease in NOx levels in all modelled scenarios, the in-combination contributions to NOx concentrations exceed 1% of the critical level at a number of receptors within all transects.

2.1.4 On the A22/A275 South Junction transect the maximum in-combination increase is 10.4% of the critical level (3.1$\mu g/m^3$), reducing to 2.7% at 200m.

2.1.5 On the A22 transects, the maximum in-combination increase is 11.4% (3.4$\mu g/m^3$) of the critical level at the closest point of the SAC designation to the road edge. This level drops quickly reducing to below 1% of the critical level at 100m. Other transects along the A22 show a quicker reduction of 1% of the critical level, with concentrations reducing below 1% between 25m and 50m from the edge of the road.

2.1.6 On the A26 the maximum in-combination increase is 75.9% (22.8$\mu g/m^3$) of the critical level at the edge of the road (Owl House transect). Concentrations remain above 1% of the critical level up to 200m from the edge of the road.

2.1.7 Applying the 1% threshold it can be seen that LSE in-combination from a change of NOx cannot be screened out for any link with the exception of the northern A22 section.

2.2 Ammonia

2.2.1 The modelling data indicates that a 1% change of the critical level of 1$\mu g\ m^{-3}$ is only exceeded for the Local Plan in-isolation on the A22/A275 junction receptor within 10m, the A275 transect within 15m of the roadside and at transects along the A22 within 2m of the road edge. There are no other exceedances of the 1% threshold for the Local Plan alone. As such these transects are screened in for further consideration in the HRA Appropriate Assessment process. It is therefore next necessary to look at in-combination effects at all other links.

2.2.2 When looking at the in-combination effect at other road links and transect receptor locations, where there is no exceedance of the 1% threshold alone, there is an exceedance at a number of receptors at all transects with the exception of the A22 northern section where there is a reduction in levels.

2.3 Nitrogen Deposition

2.3.1 On the A22 (North Section (north of the A22/A275 junction)) there is an overall reduction in nitrogen deposition levels in a scenario with the Local Plan alone and in-combination. This is shown by the percentage change relative to the critical load and total concentrations of nitrogen deposition in all future modelled scenarios. Transects on the north section of the A22 road link (Kidbrooke Wood, Stone Quarry House and Hindleap Warren transects) have therefore not been considered further in this assessment as it is considered that the Local Plan, alone or in-combination, will have no LSE.

2.3.2 On the A22/A275 when taking the Local Plan in-isolation there is an exceedance of 1% relative to the lowest critical load range (of 10kg N/ha/yr) between 0 and 15m from the road edge at the A22/A275 junction location (2.2%, 0.2kg N/ha/yr). Given there is an alone exceedance at this road link it will be screened in for further assessment. There is no exceedance of the Local Plan alone at the A22/A275 South Junction transect, and consideration is therefore given to in-combination effects. When taking into consideration the Local Plan in-combination there is an exceedance of the 1% threshold on the A22/A275 South Junction transect with a maximum level of 18.6% which represents an increase of 1.9kg N/ha/yr. Given there is an in-combination exceedance at this road link it will be screened in for further assessment.

2.3.3 On the A275 when taking the Local Plan in-isolation there is an exceedance of 1% relative to the lowest critical load range (of 10kg N/ha/yr) at within 5m of the road edge at this location. This is a maximum increase of 2.5% which represents an increase of 0.3kg N/ha/yr. Given there is an alone exceedance at this road link it will be screened in for further assessment.

2.3.4 On the A22 when taking the Local Plan in-isolation there is an exceedance of 1% relative to the lowest critical load range (of 10kg N/ha/yr) within 3m of the road edge at the Little Birch Wood transect only. This is a maximum increase of 1.1% which represents an increase of 0.1kg N/ha/yr. Given there is an alone exceedance at this road link it will be screened in for further assessment.

2.3.5 On the A26 when considering the Local Plan in-isolation there is one exceedance of 1% relative to the lowest critical load range (of 10kg N/ha/yr) at the road edge at the Owl House transect only. This is a maximum increase of 1.1% which represents an increase of 0.2kg N/ha/yr. Given there is an alone exceedance at this road link it will be screened in for further assessment.

2.3.6 As presented in Appendix A2 of the AQR, the total contribution of the Local Plan alone to nitrogen deposition is above 1% of the critical load for several road links (except for the A22 (north section), either alone or in-combination. LSEs are therefore possible and these links will be screened in for further assessment.

2.4 Acid Deposition

2.4.1 There is no exceedance of 1% change relative to the lowest critical load range on the northern section of the A22 when considered firstly alone and then in-combination. This road link is not considered further in this assessment as LSEs are not considered likely.

2.4.2 When taking the Local Plan in-isolation there is an exceedance of 1% relative to the lowest critical load range within 7m of the A22/A275 junction. There is no alone exceedance on the A275 Junction South. When taking the Local Plan in-combination there is an exceedance of 1% relative to the lowest critical load range within 200m of both transects.

2.4.3 When taking the Local Plan in-isolation there is an exceedance of 1% relative to the lowest critical load range within 4m of the A275. Given this exceedance this link will be screened in for further assessment.

2.4.4 On the A22 (South Section) when taking the Local Plan in-isolation there is an exceedance of 1% relative to the lowest critical load range within 1m of the A22 at the Little Birchwood transect only. Given this exceedance from the Local Plan alone this link will be screened in. Looking at all other transects where this is no exceedance of 1% of the critical load alone, an assessment of in-combination effects indicates that there is an exceedance of 1% relative to the lowest critical load range at most other transects along the southern section of the A22 up to a maximum of 100m from the edge of the road.

2.4.5 There is no exceedance of 1% change relative to the lowest critical load range on the A26 when considered alone. As such it is therefore necessary to consider contributions in-combination. When taking the Local Plan in-combination there is an exceedance of 1% relative to the lowest critical load range at most transects up to a maximum of 200m from the edge of the road.

2.4.6 As presented in Appendix A2 of the air quality modelling report, the total contribution of the Local Plan alone to acid deposition is below 1% of the critical load for the most sensitive habitat type (heathland) in all instances other than between 7m of the A22/A275 Junction transect and 4m of the A275.

3 Mole Gap to Reigate Escarpment SAC Screening

3.1 Nitrogen Oxides

3.1.1 Appendix A3 of the AQR shows that in-isolation contributions to NOx concentrations are largely below 1% of the critical level, with the exception of several receptors along both of the A217 transects – Fox Lane and Fort Lodge. These receptors are located within 5m of the road edge at Fox Lane and within 10m of the road edge at Fort Lodge. The maximum in-isolation contribution is 2.0% (0.6 $\mu g/m^3$) of the critical level at the immediate road edge of the A217. This falls to 1.3% (0.4 $\mu g/m^3$) at both 5m and 10m of the road edge.

3.1.2 Using the 1% screening threshold as a benchmark to screen for LSEs it can be seen that effects alone can be screened out for all road links with the exception of the A217 transect. Given there is no alone exceedance of thresholds at all other receptor transects it is necessary to next consider effects in-combination.

3.1.3 The in-combination contributions to NOx concentrations exceed 1% of the critical level at several receptors within all transects.

3.1.4 The additional NOx emissions due to traffic growth in-combination at the SAC from traffic on the M25 would be 5% (1.5$\mu g/m^3$) of the critical level at 63m from the road edge, falling by more than half to 1.9% (0.6$\mu g/m^3$) of the critical level at 200m from the road edge.

3.1.5 At its closet point the M25 is located within 67m of the SAC, with an area of approx. 5.5ha of the SAC located within 200m (the SAC covers approx. 892.3ha in total[6]) siting in SSSI management units 24 and 23. SSSI unit condition unit data indicates that unit 24 is dominated by deciduous woodland, and unit 23 by lowland calcareous grassland. RSP undertook an HRA screening assessment for the Gatwick Runway 2 project[7]. This drew on the findings of an ecological survey that was undertaken to determine the presence or absence of priority habitat within 200m of the M25 by directly examining the distribution of the priority habitat in that area. It concluded that "*the grassland within 200 m of the M25 is of a condition unlikely to support SAC quality orchidaceous rich grasslands. There are no plans to change the management of the area in the foreseeable future. Therefore, there is no potential for an increase in traffic on the M25, as a result of LGW-2R, to have a significant effect with respect to the Annex 1 priority habitat calcareous grasslands with 'important orchid sites*'. The report also notes that correspondence with Natural England has confirmed that box scrub and Yew-woodland does not occur within 200m of the M25 (within management unit 23). This was used as a basis to screen out air quality impacts of traffic growth on the M25 on the qualifying features of the SAC. Taking into consideration the distribution of SAC features, habitats within 200m of the M25, it is not considered that traffic growth from the Local Plan, alone or in-combination, will have an adverse effect on the integrity of the SAC at this location and therefore the M25 can be screened out.

3.1.6 On the B2032 (Dawcombe Wood transect) the maximum in-combination increase is 6.9% (2.1μg/m^3) of the critical level at the edge of the road. This level drops quickly, halving by 7m and reducing to below 1% of the critical level at 100m.

3.1.7 At the B2032 (Dawcombe Cottage transect) the maximum in-combination increase is 5.9% (1.8μg/m^3) of the critical level at the edge of the road. This level drops quickly, halving by 10m and reducing to below 1% of the critical level at 100m.

3.1.8 On the A24 (Longbury Wood transect) the maximum in-combination increase is 1.4% (0.5μg/m^3) of the critical level at 78m from the edge of the road. This level drops quickly reducing to below 1% of the critical level at 108m.

3.1.9 On the A24 (Cowslip Lane transect) the maximum in-combination increase is 1.2% (0.4μg/m^3) of the critical level at 60m from the edge of the road. This level drops quickly reducing to below 1% of the critical level at 75m.

3.1.10 On the A24 (Lodge Hill transect) the maximum in-combination increase is 1.8% (0.5μg/m^3) of the critical level at 80m from the edge of the road. This level drops quickly reducing to below 1% of the critical level at 150m.

3.1.11 On the A24 (Box Hill transect) the maximum in-combination increase is 5.2% (1.5μg/m^3) of the critical level at 12m from the edge of the road. This level drops quickly reducing to below 1% of the critical level at 112m.

[6] JNCC. Mole Gap to Reigate Escarpment SAC. Available at: https://sac.jncc.gov.uk/site/UK0012804 [Date Accessed 21/12/22].

[7] RPS. 2017. Gatwick Runway 2. Mole Gap to Reigate Escarpment SAC and Ashdown Forest SPA/SAC. Revised Habitats Regulations Assessment Report Stage 1 (Screening).

3.1.12 Applying the 1% threshold it can be seen that LSE in-combination from a change of NOx cannot be screened out at all links.

3.2 Ammonia

3.2.1 Appendix A3 of the AQR presents the modelled results for ammonia for the baseline and future do nothing, do minimum and do something scenarios. Results also show the percentage change in the relative critical level for the Local Plan alone and the Local Plan in-combination with other plans and projects.

3.2.2 The modelling data indicates that a 1% change of the critical level of 1 $\mu g\ m^{-3}$ is only exceeded for the Local Plan in-isolation on the A217. These exceedances are at the Fox Lane transect within 25m and the Fort Lodge transect within 30m of the roadside.

3.2.3 When looking at the in-combination effect at other road links, where there is no exceedance of the 1% threshold alone, it can be seen that there is an exceedance at a number of receptors at all transects with varying distances from the edge of the road.

3.2.4 The modelling data indicates that a 1% change of the critical level of 3$\mu g\ m^{-3}$ is only exceeded for the Local Plan in-isolation on the A217. These exceedances are at the Fox Lane transect within 25m and the Fort Lodge transect within 30m of the roadside.

3.2.5 This pattern is reflected when screening against the 3$\mu g\ m^{-3}$ level. Exceedances from the Local Plan alone are on the A217 at Fox Lane and Fort Lodge up to 10m from the road edge. When considered in-combination the upper level is exceeded at all other transects (where the 1% alone threshold was not breeched) for the upper level.

3.3 Nitrogen Deposition

3.3.1 Screening of nitrogen deposition has taken into consideration specific habitat types within 200m of each road link as presented in Table 3.1 and applying habitat specific critical loads ranges.

Table 3.1: Habitat types at modelled transects

Transect	Habitat Type
A217 Fox Lane	Broadleaved, mixed and yew woodland. SSSI Unit 25.
A217 Fort Lodge	Broadleaved, mixed and yew woodland. Lowland calcareous grassland area approx. 145m to the north of the A217. SSSI Unit 25.
B2032 Dawcombe Wood	Broadleaved, mixed and yew woodland – SSSI Unit 35. Lowland calcareous grassland (important orchid site) runs adjacent to the B2032 for approx. 41m. SSSI Unit 36 notes that the calcareous grassland comprises the following species: Salad Burnett dominant (10 of 10), Thyme abundant (8 of 10), Squinancywort, Dwarf thistle and common rockrose frequent (6 of 10). Birds foot trefoil and Mouse-ear Hawkweed occasional (4 of 10), Cowslip, Rough Hawkbit and Small scabious rare (2 of 10). Also present in this unit is a variety of Orchid species and Twayblades, Autumn Gentian, Carline thistle and Burnett saxifrage.
B2032 Dawcombe Cottage	As above.
A24 Longbury Wood	Broadleaved, mixed and yew woodland.
A24 Cowslip Lane	River Cliffs - deciduous woodland (SSSI Unit notes indicate that the river is still active in this location).

Transect	Habitat Type
A24 Lodge Hill	Broadleaved, mixed and yew woodland. Lowland calcareous grassland (important orchid site).
A24 Box Hill	Broadleaved, mixed and yew woodland.

3.3.2 There are two woodland critical load ranges for the SAC. One is for broadleaved, mixed and yew woodland (*Asperulo-Fagetum* beech forests) with a range of 10-20kg N/ha/yr and the other is for coniferous woodland (*Taxus baccata* woods) with a range of 5-15kg N/ha/yr. APIS indicates that the range of nitrogen deposition provided for coniferous woodland is based on research into northern pine and spruce forests. As with ammonia, the lower end of this range (5kg N/ha/yr) is determined by the potential of a site to support a diverse lichen and bryophyte community[8]. This habitat type is not present at this woodland and therefore the upper end of this critical load range is considered to be the most appropriate level to apply in this assessment. The lower level of the broadleaved woodland range of 10kg N/ha/yr has therefore been applied in this assessment in areas of woodland habitat.

3.3.3 The lowest critical load range for calcareous grassland is 15kg N/ha/yr and the lowest critical load for dry heaths is 10kg N/ha/yr. These critical loads have been applied in this assessment.

3.3.4 At the A217, the percentage change relative to the lowest critical load range (of 10kg N/ha/yr) exceeds 1% for a number of receptors up to 30m from the edge of the road for the Local Plan in-isolation. There is a maximum increase in deposition of 6.9% of the critical level (which represents an increase in 0.7kg N/ha/yr). This level halves by 10m from the edge of the road, reducing to 1.5% at 25m and beyond this dropping below 1%. It is therefore necessary to consider in-combination effects at locations beyond 25m.

3.3.5 On the A217 when considering the Local Plan in-combination at receptors on the A217, the 1% threshold is exceeded to 200m from the road edge. The highest exceedance is 89.2% of the critical load (at the edge of the road) which represents an increase of 8.9kg N/ha/yr. This level reduces, halving at 50m from the road edge and reducing to 2.9% by 200m. In-combination the 1% threshold is therefore exceeded at all receptor locations.

3.3.6 On the B2032 (and B2033) when taking the Local Plan in-isolation there is no change in exceedance of 1% relative to the lowest critical load range (of 10kg N/ha/yr) at any location. It is therefore necessary to next consider impacts in-combination. Modelling shows that there is an exceedance greater than 1% of the lowest critical load range (of 10kg N/ha/yr) at a number of receptors up to 50m from the edge of the road. The worst-case exceedance is 15.1% which represents an increase in-combination of 1.5kgN/ha/yr. This level reduces quickly, halving by 7m from the edge of the road.

[8] APIS. Nitrogen Deposition – Coniferous Woodland. Available at: http://www.apis.ac.uk/node/969 [Date Sourced: 05/04/21]

3.3.7 On the A24, when taking the Local Plan in-isolation there is no exceedance of the 1% threshold relative to the lowest critical load range (of 10kg N/ha/yr) at any location. It is therefore necessary to next consider impacts in-combination. There is an exceedance in-combination change greater than 1% relative to the lowest critical load range (of 10kg N/ha/yr) at a number of receptors up to 200m from the edge of the road. The worst-case exceedance is at the Box Hill transect at 14.7% which represents an increase in-combination of 1.5kgN/ha/yr. This level reduces quickly, halving by 32m from the edge of the road. This percentage change is relatively high when compared to the other three modelled transects on the A24, which have a maximum change of 3.2% which represents an increase of 0.4kg N/ha/yr.

3.3.8 As presented in Appendix A3 of the AQR, the total contribution of the Local Plan alone to nitrogen deposition is below 1% of the critical load in all instances other than between 0 and 30m on the A217 transects. When considering the 1% change in-combination it can be seen that there is an exceedance at all transects and at the majority of receptor locations. It is therefore necessary to consider air quality impacts in more detail.

3.4 Acid Deposition

3.4.1 The lowest acid deposition critical load level is for heath habitat. This is 1.449 keq/ha/yr and has been applied as a worst-case screening threshold for the data in the AQR. It is however noted that the majority of receptor locations are coincident with woodland (with a minimum range of 1.623 keq/ha/yr) and / or grassland habitat (with a minimum range of 4.856 keq/ha/yr). As noted, these habitat types have a higher critical load range than heathland.

3.4.2 At the A217 the percentage change relative to the lowest critical load range (of 1.449 keq/ha/yr) exceeds 1% up to 15m from the edge of the road for the Local Plan alone. There is a maximum increase in deposition of 3.4% of the critical level (which represents an increase in 0.05 keq/ha/yr). This level falls below the 1% level beyond 15m.

3.4.3 At the A217 when considering the Local Plan in-combination at receptors on the A217 beyond 15m, the lowest critical load range is exceeded to 200m from the road edge. The highest exceedance is 44% of the critical load (at the edge of the road) which represents an increase of 0.64 keq/ha/yr. This level reduces, halving at 10m from the road edge and reducing to 1.4% by 200m. In-combination the 1% threshold is exceeded at all receptor locations with the exception of 200m from the road at the Fort Lane transect.

3.4.4 At the B2032 (and B2033) when taking the Local Plan in-isolation there is no change in exceedance of 1% relative to the lowest critical load range (of 1.499 keq/ha/yr) at any location. Concentrations from the Local Plan alone are shown to be 0%. When looking at the concentrations from the Local Plan alone, the acid contribution is 0.0 keq/ha/yr (Table 13). This is considered to be nugatory (zero) and therefore it is not necessary to consider in-combination acid deposition impacts further for these road links.

3.4.5 At the A24 when taking the Local Plan in-isolation there is no exceedance of 1% relative to the lowest critical load range at any location. Concentrations from the Local Plan alone are shown to be 0%. When looking at the concentrations from the Local Plan alone, the acid contribution is 0.0 keq/ha/yr (Table 3.2). This is considered to be nugatory (zero) and therefore it is not necessary to consider in-combination acid deposition impacts further for this road link.

Table 3.2: Summary of key annual mean total acid deposition for transects at closest transect receptor point to SAC

Transect Name	Distance from road (m)	Habitat Type (Table 9)	Acid deposition from Local Plan alone (keq/ha/yr)	Acid deposition from Local Plan in combination with other plans and projects (keq/ya/yr)	Change in total concentration from 2015 baseline (2035 do something minus 2015 baseline, total concentration Kg N/ha/yr)
A217 Fort Lodge	7	Woodland	0.03	0.41	0.01
A217 Fox Lane	0	Woodland	0.05	0.64	0.22
B2032 Dawcombe Wood	0	Grass	0.00	0.11	-0.04
B2032 Dawcombe Cottage	0	Grass	0.00	0.1	-0.23
A24 Longbury Wood	78	Woodland	0.00	0.02	-0.23
A24 Cowslip Lane	60	Woodland	0.00	0.02	-0.23
A24 Lodge Hill	80	Woodland	0.00	0.02	-0.25
A24 Box Hill	12	Woodland	0.00	0.10	-0.21

3.4.6 As presented in Appendix A3 of the AQR, the total contribution of the Local Plan alone to acid deposition is below 1% of the critical load for the most sensitive habitat type (heath) in all instances other than between 0 and 15m on the A217 transects.

3.4.7 Contributions of traffic from the Local plan alone on the A24 and B2032 are zero. For these links the data shows that there is an improvement in acid deposition levels in comparison to the baseline scenario. It is therefore considered that there can be no contribution from these road links to any in-combination effect.

4 Conclusion

4.1 Screening Conclusions

4.1.1 Based on a review of air quality modelling data against Natural England's 1% screening threshold for each pollutant presented in Sections 2 and 3, air quality pathways of impacts at Mole Gap to Reigate Escarpment SAC, Ashdown Forest SAC and Ashdown Forest SPA have been screened in for further consideration in the HRA process.

Appendix F: Policy Pre-Screening Summary

Crawley: A vision

Policy Number	Policy Name	Screening for LSE	Conclusion
n/a	Crawley a Vision	The vision sets out aspirations for the Local Plan. It will not have likely significant effect on any Habitats site and can be screened out under Category A.	Screened out.

Sustainable Development

Policy Number	Policy Name	Screening for LSE	Conclusion
SD1	Presumption in Favour of Sustainable Development	This policy sets out the Council's commitment to take a positive approach to sustainable development. The policy is positive in nature, does not trigger any development or change and can therefore be screened out under Category B.	Screened out.
SD2	Enabling Healthy Lifestyles and Wellbeing	This policy sets out the Council's aspirations to support healthy lifestyles and promote wellbeing. The policy is positive in nature, does not trigger any development or change and can therefore be screened out under Category B.	Screened out.

WELLBEING AND COMMUNITIES
Character, Landscape and Development Form

Policy Number	Policy Name	Screening for LSE	Conclusion
CL1	Neighbourhood Principle	This policy sets out the Council's commitment to protect and enhance the neighbourhood principle. The policy is positive in nature, does not trigger any development or change and can therefore be screened out under Category B.	Screened out.
CL2	Making Successful Places – Principles of Good Urban Design	This policy sets out the requirements for development to assist in the creation, retention and/or enhancement of successful places during design. It sets out a number of principles that development must meet through design. The policy is positive in nature, does not trigger any development or change and can therefore be screened out under Category F.	Screened out.

CL3	Movement Patterns, Layout and Sustainable Urban Design	This policy sets out design principles to ensure sustainable patters of movement at new development can be achieved and sustainable methods of transport promoted. The policy is positive in nature, does not trigger any development or change and can therefore be screened out under Category F.	Screened out.
CL4	Compact Development – Layout, Scale and Appearance	This policy sets out residential density requirements which must be met through design. The policy is positive in nature, does not trigger any development or change and can therefore be screened out under Category F.	Screened out.
CL5	Significant Development, Masterplanning and Design Success	This policy sets out the requirements for certain development applications to be supported by masterplans and meet design code requirements. The policy is positive in nature, does not trigger any development or change and can therefore be screened out under Category F.	Screened out.
CL6	Structural Landscaping	This policy sets out design requirements regarding landscaping (trees and soft landscaping). The policy is positive in nature, does not trigger any development or change and can therefore be screened out under Category F.	Screened out.
CL7	Important and Valued Landscape and Views	This policy sets out a number of important views which are identified in the Local Plan Map and the requirement for these to be protected and / or enhanced. The policy is positive in nature aiming to protect the natural environment, does not trigger any development or change and can therefore be screened out under Category D.	Screened out.
CL8	Development Outside the Built-Up Area	This policy sets out requirements for development outside the built-up area. It sets out a series of criteria to ensure that the nature and attractive setting is maintained. The policy is positive in nature aiming to protect the natural environment, does not trigger any development or change and can therefore be screened out under Category D.	Screened out.
CL9	High Weald Area of Outstanding Natural Beauty	This policy sets out requirements to ensure the natural beauty of the High Weald AONB is conserved and protected. The policy is positive in nature aiming to protect the natural environment, does not trigger any development or change and can therefore be screened out under Category D.	Screened out.

Design & Development Requirement

Policy Number	Policy Name	Screening for LSE	Conclusion
DD1	Normal Requirements of All New Development	This policy sets out a series of design requirements for new development. The policy is positive in nature, does not trigger any development or change and can therefore be screened out under Category F.	Screened out.
DD2	Inclusive Design	This policy sets out access requirements to ensure inclusive design. The policy does not trigger any development or change and can therefore be screened out under Category F.	Screened out.

DD3	Standards for All New Dwellings (including conversions)	This policy sets out minimum floorspace standards for all new dwellings and other requirements such as amenity space and space standards. The policy does not trigger any development or change and can therefore be screened out under Category F.	Screened out.
DD4	Tree Replacement Standards	This policy sets out provisions for tree retention and provision for new development design. The policy is positive in nature, does not trigger any development or change and can therefore be screened out under Category F.	Screened out.
DD5	Aerodrome Safeguarding	This sets out policy requirements for development design to ensure the continued safe operation of aerodromes. The policy does not trigger any development or change and can therefore be screened out under Category F.	Screened out.
DD6	Advertisements	This policy sets out design requirements regarding advertisements. The policy does not trigger any development or change and can therefore be screened out under Category F.	Screened out.
DD7	Crossovers	This policy sets out requirements regarding crossovers. The policy does not trigger any development or change and can therefore be screened out under Category F.	Screened out.

Heritage

Policy Number	Policy Name	Screening for LSE	Conclusion
HA1	Heritage Assets	This policy sets out provision for the protection of heritage assets. The policy is positive in nature aiming to protect the historic environment, does not trigger any development or change and can therefore be screened out under Category D.	Screened out.
HA2	Conservation Areas	This policy sets out provision for the protection of Conservation Areas. The policy is positive in nature aiming to protect the historic environment, does not trigger any development or change and can therefore be screened out under Category D.	Screened out.
HA3	Areas of Special Local Character	This policy sets out provision for the protection of Areas of Special Landscape Character. The policy is positive in nature aiming to protect the historic and natural environment, does not trigger any development or change and can therefore be screened out under Category D.	Screened out.
HA4	Listed Buildings and Structures	This policy sets out provision for the protection of Listed Buildings and Structures. The policy is positive in nature aiming to protect the historic environment, does not trigger any development or change and can therefore be screened out under Category D.	Screened out.
HA5	Locally Listed Buildings	This policy sets out provision for the protection of Locally Listed Buildings. The policy is positive in nature aiming to protect the historic environment, does not trigger any development or change and can therefore be screened out under Category D.	Screened out.

HA6	Historic Parks and Gardens	This policy sets out provision for the protection of Historic Parks and Gardens. The policy is positive in nature aiming to protect the historic environment, does not trigger any development or change and can therefore be screened out under Category D.	Screened out.
HA7	Heritage Assets of Archaeological Interest	This policy sets out provision for the protection of Heritage Assets of Archaeological Interest. The policy is positive in nature aiming to protect the historic environment, does not trigger any development or change and can therefore be screened out under Category D.	Screened out.

Open Space, Sport & Recreation

Policy Number	Policy Name	Screening for LSE	Conclusion
OS1	Open Space, Sport and Recreation	This policy sets out provisions to protect and ensure adequate provision of open space, sport and recreation space. The policy does not trigger any development or change and can therefore be screened out under Category F.	Screened out.
OS2	Provision of Open Space and Recreational Facilities	This policy sets out provisions to protect and ensure adequate provision of open space and recreational facilities to meet future development needs. It promotes the application of NEs Natural Green Space Standard recommendations. The policy does not trigger any development or change and can therefore be screened out under Category F.	Screened out.
OS3	Rights of Way and Access to the Countryside	This policy promotes the protection of Rights of Way and their character. The policy does not trigger any development or change and can therefore be screened out under Category F.	Screened out.

Infrastructure Provision

Policy Number	Policy Name	Screening for LSE	Conclusion
IN1	Infrastructure Provision	This policy sets out the requirement for development to be supported by adequate infrastructure provision. The policy does not trigger any development or change and can therefore be screened out under Category F.	Screened out.
IN2	The Location and Provision of New Infrastructure	This policy sets out the requirements for new infrastructure applications. The policy does not trigger any development or change and can therefore be screened out under Category F.	Screened out.
IN3	Supporting High Quality Communications	This policy sets out design requirements in terms of broadband provision. The policy does not trigger any development or change and can therefore be screened out under Category F.	Screened out.

ECONOMIC GROWTH AND SOCIAL MOBILITY
Economic Growth

Policy Number	Policy Name	Screening for LSE	Conclusion
EC1	Sustainable Economic Growth	This policy sets out economic growth requirements in the Plan area over the Plan period. The impact of individual employment allocations alone has been screened for LSEs in Appendix E (screening of allocations). The cumulative impact of Local Plan employment growth has the potential to create LSEs in terms of changes to traffic flows (with impacts on air quality at Habitats sites identified as being vulnerable to air pollution and within commuting zones) and hydrological changes (due to increased water demand and discharge of polluted water with LSEs on Habitats sites which are vulnerable to changes in water quantity and quality). Possible LSEs in terms of air pollution (alone and in-combination) at the following Habitats sites: - Ashdown Forest SAC; - Ashdown Forest SPA; and - Mole Gap to Reigate Escarpment SAC. LSE due to hydrological changes of the Local Plan alone have been screened in at: - Mole Gap to Reigate Escarpment SAC; and - Arun Valley SAC; - Arun Valley SPA; - Arun Valley Ramsar; and - The Mens SAC (knock on impacts on areas of functionally linked land). This policy is screened in under Category I (hydrology, functionally linked land) and Category L (air quality).	Screened in.
EC2	Economic Growth in Main Employment Areas	This policy identifies the Main Employment Areas. It also protects against a net loss of employment from these key areas. The policy does not in itself trigger any development or change and can therefore be screened out under Category F.	Screened out.
EC3	Manor Royal	This policy sets out employment development restrictions and guidelines at Manor Royal. The policy does not in itself trigger any development or change and can therefore be screened out under Category F.	Screened out.
EC4	Strategic Employment Location	This policy sets out design requirements for employment land at Gatwick Green. The impact of this individual employment allocation is screened for LSEs in Appendix E (screening of allocations).	Screened in.

		The cumulative impact of Local Plan employment growth has the potential to create LSEs in terms of changes to traffic flows (with impacts on air quality at Habitats sites identified as being vulnerable to air pollution and within commuting zones) and hydrological changes (due to discharge of polluted water with LSEs on Habitats sites which are vulnerable to changes in water quantity and quality). Possible LSEs in terms of air pollution (alone and in-combination) at the following Habitats sites: - Ashdown Forest SAC; - Ashdown Forest SPA; and - Mole Gap to Reigate Escarpment SAC. LSE due to hydrological changes of the Local Plan alone have been screened in at: - Mole Gap to Reigate Escarpment SAC. This allocation is not located within the Sussex North WRZ. This policy is screened in under Category I (hydrology, functionally linked land) and Category L (air quality).	
EC5	Employment and Skills Development	This policy sets out the requirement of new development to contribute to meeting the objectives of the most up-to-date Crawley Employment and Skills Programme. The policy does not in itself trigger any development or change and can therefore be screened out under Category F.	Screened out.
EC6	High Quality Office Provision	This policy sets out requirements in terms of office provision. The policy does not in itself trigger any development or change and can therefore be screened out under Category F.	Screened out.
EC7	Hotel and Visitor Accommodation	This policy sets out requirements in terms of hotel and visitor accommodation. The policy does not in itself trigger any development or change and can therefore be screened out under Category F.	Screened out.
EC8	Evening and Night-time Economy	This policy sets out requirements in terms of the evening and night-time economy. The policy does not in itself trigger any development or change and can therefore be screened out under Category F.	Screened out.
EC9	Supporting the Creative Industries	This policy sets out requirements in terms of the creative industries. The policy does not in itself trigger any development or change and can therefore be screened out under Category F.	Screened out.
EC10	Flexible Temporary Cultural and Creative Uses	This policy sets out requirements in terms of the flexible temporary use for cultural and creative uses. The policy does not in itself trigger any development or change and can therefore be screened out under Category F.	Screened out.
EC11	Employment Development and Amenity Sensitive Uses	This policy sets out requirements to ensure that employment development does not detract from residential amenity. The policy does not in itself trigger any development or change and can therefore be screened out under Category F.	Screened out.

EC12	Neighbourhood Centres	This policy sets out design requirements for the use of neighbourhood centres for employment space. The policy does not in itself trigger any development or change and can therefore be screened out under Category F.	Screened out.
EC13	Rural Economy	This policy sets out requirements in terms of the development beyond the built-up area boundary. The policy does not in itself trigger any development or change and can therefore be screened out under Category F.	Screened out.

Gatwick Airport

Policy Number	Policy Name	Screening for LSE	Conclusion
GAT1	Development of the Airport with a Single Runway	This policy sets out the support of the Local Plan for the development of facilities which contribute to the sustainable growth of Gatwick Airport as a single runway, two terminal airport. It sets out a number of criteria. The policy does not in itself trigger any development or change and can therefore be screened out under Category F. This policy also references the potential development of Nationally Significant Projects at the airport which would be outside the scope of the Local Plan. The delivery of the Local Plan is not reliant on such development at the airport and therefore this policy can also be screened out under Category C.	Screened out.
GAT2	Safeguarding Land	This policy safeguards land from development which may be used for expansion at the airport. The policy does not in itself trigger any development or change and can therefore be screened out under Category F.	Screened out.
GAT3	Gatwick Airport Related Parking	This policy places restrictions on the provision of airport related parking. The policy does not in itself trigger any development or change and can therefore be screened out under Category F.	Screened out.
GAT4	Employment Uses at Gatwick	This policy sets out requirements for changes in employment floorspace at the airport. The policy does not in itself trigger any development or change and can therefore be screened out under Category F.	Screened out.

Crawley Town Centre

Policy Number	Policy Name	Screening for LSE	Conclusion
TC1	Primary Shopping Area	This policy sets out guidelines for development within Primary Shopping Areas. The policy does not in itself trigger any development or change and can therefore be screened out under Category F.	Screened out.
TC2	Town Centre Neighbourhood Facilities	This policy sets out requirements in terms of the provision of town centre provisions. The policy does not in itself trigger any development or change and can therefore be screened out under Category F.	Screened out.

TC3	Town Centre Key Opportunity Sites	This policy allocates key sites for main town centre uses and mixed-use development. All allocations are screened individually in Appendix E. The cumulative impact of all Local Plan housing growth under this policy has the potential to create LSEs in terms of changes to traffic flows (with impacts on air quality at Habitats sites identified as being vulnerable to air pollution and within commuting zones) and hydrological changes (due to increased water demand and discharge of polluted water with LSEs on Habitats sites which are vulnerable to changes in water quantity and quality). Possible LSEs in terms of air pollution (alone and in-combination) at the following Habitats sites: - Ashdown Forest SAC; - Ashdown Forest SPA; and - Mole Gap to Reigate Escarpment SAC. LSE due to hydrological changes of the Local Plan alone have been screened in at: - Mole Gap to Reigate Escarpment SAC; and - Arun Valley SAC; - Arun Valley SPA; - Arun Valley Ramsar; and - The Mens SAC (knock on impacts on areas of functionally linked land). This policy is screened in under Category I (hydrology, functionally linked land) and Category L (air quality).	Screened in.
TC4	Active and Engaging Frontages	This policy sets out development requirements for frontages. The policy does not in itself trigger any development or change and can therefore be screened out under Category F.	Screened out.
TC5	Town Centre First	This policy sets out the Council's strategy in terms of town centre and out of town development. The policy does not in itself trigger any development or change and can therefore be screened out under Category F.	Screened out.

HOUSING
Housing Delivery

Policy Number	Policy Name	Screening for LSE	Conclusion
H1	Housing Provision.	This policy allocates key sites to deliver the housing requirements set out in H1. All allocations are screened individually in Appendix E. The cumulative impact of all Local Plan housing growth under this policy has the potential to create LSEs in terms of changes to traffic flows (with impacts on air quality at Habitats sites identified as being vulnerable to air pollution and within commuting zones) and hydrological	Screened in.

		changes (due to increased water demand and discharge of polluted water with LSEs on European sites which are vulnerable to changes in water quantity and quality). Possible LSEs in terms of air pollution (alone and in-combination) at the following Habitats sites: - Ashdown Forest SAC; - Ashdown Forest SPA; and - Mole Gap to Reigate Escarpment SAC. LSE due to hydrological changes of the Local Plan alone have been screened in at: - Mole Gap to Reigate Escarpment SAC; and - Arun Valley SAC; - Arun Valley SPA; - Arun Valley Ramsar; and - The Mens SAC (knock on impacts on functionally linked land). This policy is screened in under Category I (hydrology and functionally linked land) and Category L (air quality).	
H2	Key Housing Sites	This policy allocates key sites to deliver the housing requirements set out in H1. All allocations are screened individually in Appendix E. The cumulative impact of all Local Plan housing growth under this policy has the potential to create LSEs in terms of changes to traffic flows (with impacts on air quality at Habitats sites identified as being vulnerable to air pollution and within commuting zones) and hydrological changes (due to increased water demand and discharge of polluted water with LSEs on European sites which are vulnerable to changes in water quantity and quality). Possible LSEs in terms of air pollution (alone and in-combination) at the following Habitats sites: - Ashdown Forest SAC; - Ashdown Forest SPA; and - Mole Gap to Reigate Escarpment SAC. LSE due to hydrological changes of the Local Plan alone have been screened in at: - Mole Gap to Reigate Escarpment SAC; and - Arun Valley SAC; - Arun Valley SPA; - Arun Valley Ramsar; and - The Mens SAC (knock on impacts on functionally linked land).	Screened in.

		This policy is screened in under Category I (hydrology and functionally linked land) and Category L (air quality).	
H3	Housing Typologies	This policy sets out housing design requirements. The policy does not in itself trigger any development or change and can therefore be screened out under Category F.	Screened out.
H3a	Estate Regeneration	This policy sets out housing design requirements. The policy does not in itself trigger any development or change and can therefore be screened out under Category F.	Screened out.
H3b	Densification, Infill Opportunities and Small Sites	This policy sets out housing design requirements. The policy does not in itself trigger any development or change and can therefore be screened out under Category F.	Screened out.
H3c	Town Centre Sites	This policy sets out housing design requirements. The policy does not in itself trigger any development or change and can therefore be screened out under Category F.	Screened out.
H3d	Upward Extensions	This policy sets out housing design requirements. The policy does not in itself trigger any development or change and can therefore be screened out under Category F.	Screened out.
H3e	Conversions from Commercial/Non-Residential Uses	This policy sets out housing design requirements. The policy does not in itself trigger any development or change and can therefore be screened out under Category F.	Screened out.
H3f	Open Spaces	This policy sets out open space design requirements. The policy does not in itself trigger any development or change and can therefore be screened out under Category F.	Screened out.

Meeting Housing Needs

Policy Number	Policy Name	Screening for LSE	Conclusion
H4	Future Housing Mix	This policy sets out the requirements for the mix of housing to meet local housing needs. The policy does not in itself trigger any development or change and can therefore be screened out under Category F.	Screened out.
H5	Affordable Housing	This policy sets out the requirements for the delivery of affordable housing in new development. The policy does not in itself trigger any development or change and can therefore be screened out under Category F.	Screened out.
H6	Build to Rent	This policy sets out provisions for build to rent housing. The policy does not in itself trigger any development or change and can therefore be screened out under Category F.	Screened out.
H7	Self and Custom Build	This policy sets out requirements for self and custom build housing. The policy does not in itself trigger any development or change and can therefore be screened out under Category F.	Screened out.
H8	Gypsy, Traveller and Travelling Showpeople Sites	This policy allocates one reserve site for Gypsy and Traveller pitches for 10 pitches. It also sets out provisions for development of other sites for Gypsy and Travellers. The LSE of this allocation is assessed in Appendix D. The cumulative impact of all this allocation in-combination with other allocations (for housing and employment) has the potential to create LSEs in terms of changes to traffic flows (with	Screened in.

		impacts on air quality at Habitats sites identified as being vulnerable to air pollution and within commuting zones) and hydrological changes (due to increased water demand and discharge of polluted water with LSEs on Habitats sites which are vulnerable to changes in water quantity and quality). Possible LSEs in terms of air pollution (alone and in-combination) at the following Habitats sites: - Ashdown Forest SAC; - Ashdown Forest SPA; and - Mole Gap to Reigate Escarpment SAC. LSE due to hydrological changes of the Local Plan alone have been screened in at: - Mole Gap to Reigate Escarpment SAC; and - Arun Valley SAC; - Arun Valley SPA; - Arun Valley Ramsar; and - The Mens SAC (knock on impacts on areas of functionally linked land). This policy is screened in under Category I (hydrology and functionally linked land) and Category L (air quality).	
H9	Houses in Multiple Occupation	This policy sets out requirements for houses in multiple occupation. The policy does not in itself trigger any development or change and can therefore be screened out under Category F.	Screened out.

ENVIRONMENTAL SUSTAINABILITY
Green Infrastructure and Biodiversity

Policy Number	Policy Name	Screening for LSE	Conclusion
GI1	Green Infrastructure	This policy sets out design requirements for green infrastructure. The policy is positive in nature aiming to protect the natural environment, does not trigger any development or change and can therefore be screened out under Category D.	Screened out.
GI2	Biodiversity and Net Gain	This policy sets out design requirements for biodiversity and net gain. The policy is positive in nature aiming to protect the natural environment, does not trigger any development or change and can therefore be screened out under Category D.	Screened out.
GI3	Biodiversity Sites	This policy sets out the hierarchy of biodiversity sites. The policy is positive in nature aiming to protect the natural environment, does not trigger any development or change and can therefore be screened out under Category D.	Screened out.

GI4	Local Green Space	This policy sets out provisions to protect local green space. The policy is positive in nature aiming to protect the natural environment, does not trigger any development or change and can therefore be screened out under Category D.	Screened out.

Sustainable Development and Construction

Policy Number	Policy Name	Screening for LSE	Conclusion
SDC1	Sustainable Design and Construction	This policy sets out a series of requirements for all new development in terms of sustainable design and construction. The policy does not in itself trigger any development or change and can therefore be screened out under Category F.	Screened out.
SDC2	District Energy Networks	This policy encourages the development of district energy networks. The policy does not in itself trigger any development or change and can therefore be screened out under Category F.	Screened out.
SDC3	Tackling Water Stress	This policy sets out requirements to achieve water efficiency. The policy is positive in nature aiming to protect the natural environment, does not trigger any development or change and can therefore be screened out under Category D.	Screened out.
SDC4	Water Neutrality	This policy sets out the requirement for all development within the Sussex North Water Resource Zone (WRZ) to demonstrate water neutrality through water efficient design and offsetting of any net additional water use of the development. It sets out requirements in relation to water efficient design requirements and offsetting. It references the LPA off-setting scheme to mitigate for local plan development and Neighbourhood Plans. This policy is a bespoke policy designed specifically to avoid harmful effects on the Arun Valley SAC, SPA and Ramsar designations. As such it has been screened in under Category M.	Screen in.

Environmental Protection

Policy Number	Policy Name	Screening for LSE	Conclusion
EP1	Development and Flood Risk	This policy sets out requirements to mitigate flood risk from new development. The policy is positive in nature aiming to protect the natural environment, does not trigger any development or change and can therefore be screened out under Category D.	Screened out.
EP2	Flood Risk Guidance for Householder Development, Small Non- Residential Extensions	This policy sets out requirements for flood risk assessments. The policy is positive in nature aiming to protect the natural environment, does not trigger any development or change and can therefore be screened out under Category D.	Screened out.

EP3	Land and Water Quality	This policy sets out requirements for new development to protect land and water quality. The policy is positive in nature aiming to protect the natural environment, does not trigger any development or change and can therefore be screened out under Category D.	Screened out.
EP4	Development and Noise	This policy sets out requirements for new development to mitigate unacceptable levels of noise. The policy is positive in nature aiming to protect the natural environment, does not trigger any development or change and can therefore be screened out under Category D.	Screened out.
EP5	Air Quality	This policy sets out requirements to reduce air pollution and improve air quality. The policy is positive in nature aiming to protect the natural environment, does not trigger any development or change and can therefore be screened out under Category D.	Screened out.
EP6	External Lighting	This policy sets out design requirements to reduce light pollution. The policy is positive in nature aiming to protect the natural environment, does not trigger any development or change and can therefore be screened out under Category D.	Screened out.

Sustainable Transport

Policy Number	Policy Name	Screening for LSE	Conclusion
ST1	Development and Requirements for Sustainable Transport	This policy sets out design requirements to promote sustainable transport in new development. The policy does not in itself trigger any development or change and can therefore be screened out under Category F.	Screened out.
ST2	Car and Cycle Parking Standards	This policy sets out design requirements for car and cycle parking standards. The policy does not in itself trigger any development or change and can therefore be screened out under Category F.	Screened out.
ST3	Improving Rail Stations	This policy sets out how new development will support railway stations. The policy does not in itself trigger any development or change and can therefore be screened out under Category F.	Screened out.
ST4	Search for a Crawley Western Multi-Modal Transport Link Road	This policy safeguards a search corridor for a Crawley Western Multi-Modal Transport Link Road. The Local Plan does not trigger the requirement for this road or require on its delivery to secure development set out over the Plan period. As such it can be screened out under Category C.	Screened out.

Appendix G: Allocations Pre-Screening Summary

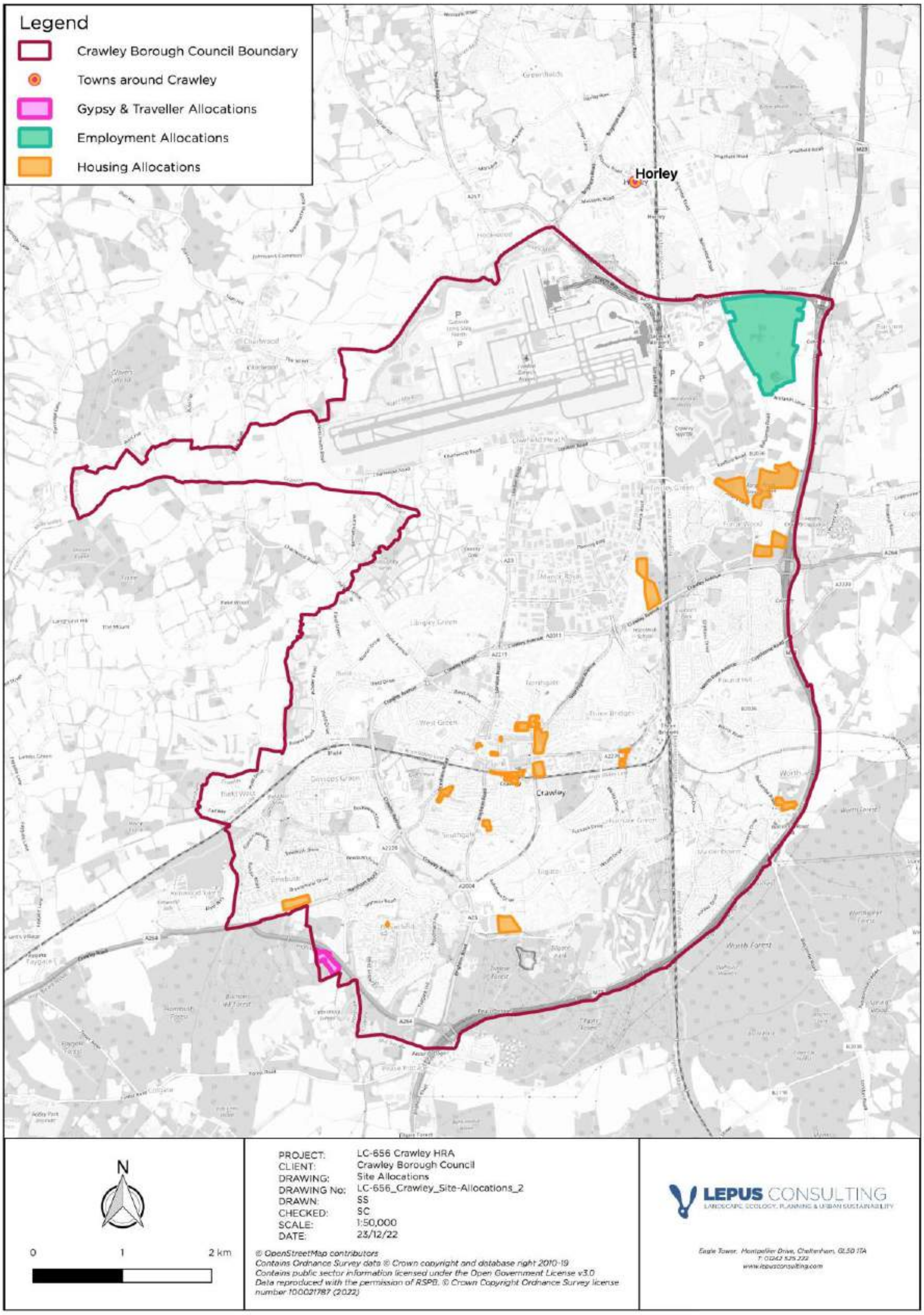

Figure G.1: Plan of allocation locations

Table Notes:

The following sites are set out in Policy H2, TC3 and H8. Strategic allocations are assessed in Appendix F (policies) (including the strategic employment allocation at Gatwick Green).

Air Quality LSEs: All site allocations set out in the Local Plan have the potential to act cumulatively to increase traffic flows on the local and wider road network. An increase in traffic related emissions has the potential to change air quality. Applying Natural England's screening thresholds, air quality likely significant effects (LSEs) are considered possible at Mole Gap to Reigate Escarpment SAC, Ashdown Forest SPA and Ashdown Forest SAC as a result of the Local Plan cumulatively and in-combination with other plans and projects. As growth at all allocations (listed below) contribute towards a change in air quality, all allocations below have been screened in under Category L.

Public Access and Disturbance: No allocations are located within 400m of a Habitats site and therefore urbanisation LSEs are screened out for all allocations. No allocations are located within 7km of Ashdown Forest SAC and SPA and therefore recreational impacts at Ashdown Forest SAC and SPA have been screened out. There is no recreational zone of influence for Mole Gap to Reigate Escarpment SAC and therefore this LSE is addressed in the main HRA report further.

Habitat loss and fragmentation: Where allocations are located in the Sussex North Water Resource Zone (WRZ) (see Table E.1 below) they have the potential to have hydrological LSEs at the Arun Valley SAC, SPA and Ramsar Site. As noted in Section 6.5 of the main HRA report, barbastelle bats are a qualifying species for the Mens SAC. Research has indicated that this species of bat forage up to 7km from their roost sites within areas that lie to the east of The Mens SAC, principally on the floodplain of the River Arun. Any hydrological impact upon the River Arun and its associated habitats (which form part of the Arun Valley SAC, SPA and Ramsar) will have the potential to have knock-on LSEs upon the wider foraging habitats for the species of bat for which The Mens SAC is designated. Given there are no other Habitats sites within or close to Crawley's administrative area, and the plan area is outside the foraging areas for Bechstein's bat (which is a qualifying feature of the Mole Gap to Reigate Escarpment SAC), no further habitat loss and fragmentation impacts are anticipated.

Table E.1 screens water LSEs.

Table G.1: Pre-screening summary of allocations in the Local Plan - Policy H2 and H8

Housing Sites – Policy H2 - Deliverable

Site Name	Current site use	Area (sqm)	Housing number / proposed employment use	Hydrological link to a Habitats site	In-combination effect	Screening conclusion
North East Sector (Forge Wood Phase 4B)	Greenfield	1171350.67628	434	Allocation is located within River Mole catchment. Gatwick Stream flows through the sites. Development will require increased discharges to WwTWs which discharge to the River Mole. Alone LSEs due to changes in water quality and water quantity are expected at: - Mole Gap to Reigate Escarpment SAC. This allocation is not located within the Sussex North WRZ.	Potential LSEs from all Local Plan allocations combined and in-combination with other plans and projects include: - Air Quality at Ashdown Forest SAC/SPA and Mole Gap to Reigate Escarpment SAC. - Hydrology impacts at Mole Gap to Reigate Escarpment SAC	Screened in Category I and L.
Zurich House, East Park, Southgate	Brownfield (offices)	3061.66110435	53	Allocation is located within River Mole catchment. Development will require increased discharges to WwTWs which discharge to the River Mole. Development is likely to increase pressure on public water supply abstraction from River Arun catchment. A change in water levels / water quality may affect habitats upon which species rely.	Potential LSEs from all Local Plan allocations combined and in-combination with other plans and projects include: - Air Quality at Ashdown Forest SAC/SPA and Mole	Screened in Category I and L.

Site Name	Current site use	Area (sqm)	Housing number / proposed employment use	Hydrological link to a Habitats site	In-combination effect	Screening conclusion
				Alone LSEs due to changes in water quality and water quantity are expected at: - Mole Gap to Reigate Escarpment SAC. - Arun Valley SAP/SAC/Ramsar.	Gap to Reigate Escarpment SAC. - Hydrology impacts at Mole Gap to Reigate Escarpment SAC, Arun Valley SPA/SAC/Ramsar and The Mens SAC (knock on habitat loss / fragmentation impacts).	
Former TSB Site, Russell Way	Brownfield (cleared site)	4941.188487	59	Allocation is located within River Mole catchment. Waterlea Meadow located approx. 440m to the south. Development will require increased discharges to WwTWs which discharge to the River Mole. Development is likely to increase pressure on public water supply abstraction from River Arun catchment. A change in water levels / water quality may affect habitats upon which species rely. Alone LSEs due to changes in water quality and water quantity are expected at: - Mole Gap to Reigate Escarpment SAC. - Arun Valley SAP/SAC/Ramsar.	Potential LSEs from all Local Plan allocations combined and in-combination with other plans and projects include: - Air Quality at Ashdown Forest SAC/SPA and Mole Gap to Reigate Escarpment SAC. - Hydrology impacts at Mole Gap to Reigate Escarpment SAC, Arun Valley SPA/SAC/Ramsar and	Screened in Category I and L.

Site Name	Current site use	Area (sqm)	Housing number / proposed employment use	Hydrological link to a Habitats site	In-combination effect	Screening conclusion
					The Mens SAC (knock on habitat loss / fragmentation impacts).	
7 - 13 The Broadway & 1 - 3 Queens Square	Brownfield (upper floor ancillary retail & office space)	907.990735195	25	Allocation is located within River Mole catchment. Development will require increased discharges to WwTWs which discharge to the River Mole. Development is likely to increase pressure on public water supply abstraction from River Arun catchment. A change in water levels / water quality may affect habitats upon which species rely. Alone LSEs due to changes in water quality and water quantity are expected at: - Mole Gap to Reigate Escarpment SAC. - Arun Valley SAP/SAC/Ramsar.	Potential LSEs from all Local Plan allocations combined and in-combination with other plans and projects include: - Air Quality at Ashdown Forest SAC/SPA and Mole Gap to Reigate Escarpment SAC. - Hydrology impacts at Mole Gap to Reigate Escarpment SAC, Arun Valley SPA/SAC/Ramsar and The Mens SAC (knock on habitat loss / fragmentation impacts).	Screened in Category I and L.
Shaw House	Brownfield (offices)	1997.23880586	33	Allocation is located within River Mole catchment. Development will require increased discharges to WwTWs which discharge to the River Mole.	Potential LSEs from all Local Plan allocations combined	Screened in Category I and L.

Site Name	Current site use	Area (sqm)	Housing number / proposed employment use	Hydrological link to a Habitats site	In-combination effect	Screening conclusion
				Development is likely to increase pressure on public water supply abstraction from River Arun catchment. A change in water levels / water quality may affect habitats upon which species rely. Alone LSEs due to changes in water quality and water quantity are expected at: - Mole Gap to Reigate Escarpment SAC. - Arun Valley SAP/SAC/Ramsar.	and in-combination with other plans and projects include: - Air Quality at Ashdown Forest SAC/SPA and Mole Gap to Reigate Escarpment SAC. - Hydrology impacts at Mole Gap to Reigate Escarpment SAC, Arun Valley SPA/SAC/Ramsar and The Mens SAC (knock on habitat loss / fragmentation impacts).	
Longley Building	Brownfield (offices)	4864.72435	121	Allocation is located within River Mole catchment. Development will require increased discharges to WwTWs which discharge to the River Mole. Development is likely to increase pressure on public water supply abstraction from River Arun catchment. A change in water levels / water quality may affect habitats upon which species rely. Alone LSEs due to changes in water quality and water quantity are expected at:	Potential LSEs from all Local Plan allocations combined and in-combination with other plans and projects include: - Air Quality at Ashdown Forest SAC/SPA and Mole	Screened in Category I and L.

Site Name	Current site use	Area (sqm)	Housing number / proposed employment use	Hydrological link to a Habitats site	In-combination effect	Screening conclusion
				- Mole Gap to Reigate Escarpment SAC. - Arun Valley SAP/SAC/Ramsar.	Gap to Reigate Escarpment SAC. - Hydrology impacts at Mole Gap to Reigate Escarpment SAC, Arun Valley SPA/SAC/Ramsar and The Mens SAC (knock on habitat loss / fragmentation impacts).	
Land adj Steers Lane	Greenfield	79772.4494596	185	Allocation is located within River Mole catchment. Gatwick Stream is located 147m to the west. Development will require increased discharges to WwTWs which discharge to the River Mole. Alone LSEs due to changes in water quality and water quantity are expected at: - Mole Gap to Reigate Escarpment SAC. This allocation is not located within the Sussex North WRZ.	Potential LSEs from all Local Plan allocations combined and in-combination with other plans and projects include: - Air Quality at Ashdown Forest SAC/SPA and Mole Gap to Reigate Escarpment SAC. - Hydrology impacts at Mole Gap to Reigate Escarpment SAC	Screened in Category I and L.

Housing Sites – Policy H2 - Developable

Site Name	Current site use	Area (sqm)	Housing number / proposed employment use	Hydrological link to a Habitats site	In-combination effect	Screening conclusion
Sutherland House (Eastern Section) and Land Adj	Brownfield (within site of office building now converted to flats)	9094.7832224	30	Allocation is located within River Mole catchment. Waterlea Meadow located approx. 470m to the south. Development will require increased discharges to WwTWs which discharge to the River Mole. Development is likely to increase pressure on public water supply abstraction from River Arun catchment. A change in water levels / water quality may affect habitats upon which species rely. Alone LSEs due to changes in water quality and water quantity are expected at: - Mole Gap to Reigate Escarpment SAC. - Arun Valley SAP/SAC/Ramsar.	Potential LSEs from all Local Plan allocations combined and in-combination with other plans and projects include: - Air Quality at Ashdown Forest SAC/SPA and Mole Gap to Reigate Escarpment SAC. - Hydrology impacts at Mole Gap to Reigate Escarpment SAC, Arun Valley SPA/SAC/Ramsar and The Mens SAC (knock on habitat loss / fragmentation impacts).	Screened in Category I and L.
Land Adjacent to Desmond Anderson	Greenfield/ cleared brownfield site	35151.6341735	205	Allocation is located within River Mole catchment. Titmus Lake located approx. 150m to south and connecting water course adjacent to eastern site boundary. Development will require increased discharges to WwTWs which discharge to the River Mole. Development is likely to increase pressure on public water supply abstraction from River Arun catchment. A change in water levels /	Potential LSEs from all Local Plan allocations combined and in-combination with other plans and projects include:	Screened in Category I and L.

				water quality may affect habitats upon which species rely. Alone LSEs due to changes in water quality and water quantity are expected at: - Mole Gap to Reigate Escarpment SAC. - Arun Valley SAP/SAC/Ramsar.	- Air Quality at Ashdown Forest SAC/SPA and Mole Gap to Reigate Escarpment SAC. - Hydrology impacts at Mole Gap to Reigate Escarpment SAC, Arun Valley SPA/SAC/Ramsar and The Mens SAC (knock on habitat loss / fragmentation impacts).	
Land to the southeast of Heathy Farm	Greenfield	21084.1042775	188	Allocation is located within River Mole catchment. Development will require increased discharges to WwTWs which discharge to the River Mole. Alone LSEs due to changes in water quality and water quantity are expected at: - Mole Gap to Reigate Escarpment SAC. This allocation is not located within the Sussex North WRZ.	Potential LSEs from all Local Plan allocations combined and in-combination with other plans and projects include: - Air Quality at Ashdown Forest SAC/SPA and Mole Gap to Reigate Escarpment SAC. - Hydrology impacts at Mole Gap to Reigate Escarpment SAC	Screened in Category I and L.

Housing Allocations – Policy H2 - Housing and Neighbourhood Facilitates site

Site Name	Current site use	Area (sqm)	Housing number / proposed employment use	Hydrological link to a Habitats site	In-combination effect	Screening conclusion

The Imperial, Broadfield Barton	Brownfield (pub & residence)	1047.02495	19	Allocation is located within River Mole catchment. Development will require increased discharges to WwTWs which discharge to the River Mole. Development is likely to increase pressure on public water supply abstraction from River Arun catchment. A change in water levels / water quality may affect habitats upon which species rely. Alone LSEs due to changes in water quality and water quantity are expected at: - Mole Gap to Reigate Escarpment SAC. - Arun Valley SAP/SAC/Ramsar.	Potential LSEs from all Local Plan allocations combined and in-combination with other plans and projects include: - Air Quality at Ashdown Forest SAC/SPA and Mole Gap to Reigate Escarpment SAC. - Hydrology impacts at Mole Gap to Reigate Escarpment SAC, Arun Valley SPA/SAC/Ramsar and The Mens SAC (knock on habitat loss / fragmentation impacts).	Screened in Category I and L.

Housing Sites – Policy H2 and Policy TC3 - Town Centre Key Opportunity Sites (1,500 net dwellings)

Site Name	Current site use	Area (sqm)	Housing number / proposed employment use	Hydrological link to a Habitats site	In-combination effect	Screening conclusion
Telford Place	Brownfield (temporary car park)	17380.8379902	Part of 1,500 net dwellings	Allocation is located within River Mole catchment. Development will require increased discharges to WwTWs which discharge to the River Mole. Development is likely to increase pressure on public water supply abstraction from River Arun catchment. A change in water levels / water quality may affect habitats upon which species rely. Alone LSEs due to changes in water quality and water quantity are expected at: - Mole Gap to Reigate Escarpment SAC. - Arun Valley SAP/SAC/Ramsar.	Potential LSEs from all Local Plan allocations combined and in-combination with other plans and projects include: - Air Quality at Ashdown Forest SAC/SPA and Mole Gap to Reigate Escarpment SAC. - Hydrology impacts at Mole Gap to Reigate Escarpment SAC, Arun Valley SPA/SAC/Ramsar and The Mens SAC (knock on habitat loss / fragmentation impacts).	Screened in Category I and L.
Crawley Station and Car Parks	Brownfield (railway Station & car parks)	20443.3546409	Part of 1,500 net dwellings	Allocation is located within River Mole catchment. Development will require increased discharges to WwTWs which discharge to the River Mole. Development is likely to increase pressure on public water supply abstraction from River Arun catchment. A change in water levels / water quality may affect habitats upon which species rely. Alone LSEs due to changes in water quality and water quantity are expected at:	Potential LSEs from all Local Plan allocations combined and in-combination with other plans and projects include: - Air Quality at Ashdown Forest SAC/SPA and Mole Gap to Reigate Escarpment SAC.	Screened in Category I and L.

				- Mole Gap to Reigate Escarpment SAC. - Arun Valley SAP/SAC/Ramsar.	- Hydrology impacts at Mole Gap to Reigate Escarpment SAC, Arun Valley SPA/SAC/Ramsar and The Mens SAC (knock on habitat loss / fragmentation impacts).	
County Buildings	Brownfield (offices)	10483.1972718	Part of 1,500 net dwellings	Allocation is located within River Mole catchment. Watercourse approx. 170m to north east. Development will require increased discharges to WwTWs which discharge to the River Mole. Development is likely to increase pressure on public water supply abstraction from River Arun catchment. A change in water levels / water quality may affect habitats upon which species rely. Alone LSEs due to changes in water quality and water quantity are expected at: - Mole Gap to Reigate Escarpment SAC. - Arun Valley SAP/SAC/Ramsar.	Potential LSEs from all Local Plan allocations combined and in-combination with other plans and projects include: - Air Quality at Ashdown Forest SAC/SPA and Mole Gap to Reigate Escarpment SAC. - Hydrology impacts at Mole Gap to Reigate Escarpment SAC, Arun Valley SPA/SAC/Ramsar and The Mens SAC (knock on habitat loss / fragmentation impacts).	Screened in Category I and L.
Land North of the Boulevard	Brownfield (offices)	12892.3858454	Part of 1,500 net dwellings	Allocation is located within River Mole catchment. Development will require increased discharges to WwTWs which discharge to the River Mole. Development is likely to increase pressure on public water supply abstraction from River Arun catchment. A change in water levels / water quality may affect habitats upon which species rely.	Potential LSEs from all Local Plan allocations combined and in-combination with other plans and projects include: - Air Quality at Ashdown Forest SAC/SPA and Mole	Screened in Category I and L.

				Alone LSEs due to changes in water quality and water quantity are expected at: - Mole Gap to Reigate Escarpment SAC. - Arun Valley SAP/SAC/Ramsar.	Gap to Reigate Escarpment SAC. - Hydrology impacts at Mole Gap to Reigate Escarpment SAC, Arun Valley SPA/SAC/Ramsar and The Mens SAC (knock on habitat loss / fragmentation impacts).	
Crawley College	Brownfield (FE College)	34139.1614566	Part of 1,500 net dwellings	Allocation is located within River Mole catchment. Watercourse approx. 150m to north. Development will require increased discharges to WwTWs which discharge to the River Mole. Development is likely to increase pressure on public water supply abstraction from River Arun catchment. A change in water levels / water quality may affect habitats upon which species rely. Alone LSEs due to changes in water quality and water quantity are expected at: - Mole Gap to Reigate Escarpment SAC. - Arun Valley SAP/SAC/Ramsar.	Potential LSEs from all Local Plan allocations combined and in-combination with other plans and projects include: - Air Quality at Ashdown Forest SAC/SPA and Mole Gap to Reigate Escarpment SAC. - Hydrology impacts at Mole Gap to Reigate Escarpment SAC, Arun Valley SPA/SAC/Ramsar and The Mens SAC (knock on habitat loss / fragmentation impacts).	Screened in Category I and L.
The Old Vicarage, Church Walk (Cross Keys)	Brownfield (residential, community building, parking)	2498.22907989	Part of 1,500 net dwellings	Allocation is located within River Mole catchment. Development will require increased discharges to WwTWs which discharge to the River Mole. Development is likely to increase pressure on public water supply abstraction from River Arun catchment. A change in water levels / water	Potential LSEs from all Local Plan allocations combined and in-combination with other	Screened in Category I and L.

				quality may affect habitats upon which species rely. Alone LSEs due to changes in water quality and water quantity are expected at: - Mole Gap to Reigate Escarpment SAC. - Arun Valley SAP/SAC/Ramsar.	plans and projects include: - Air Quality at Ashdown Forest SAC/SPA and Mole Gap to Reigate Escarpment SAC. - Hydrology impacts at Mole Gap to Reigate Escarpment SAC, Arun Valley SPA/SAC/Ramsar and The Mens SAC (knock on habitat loss / fragmentation impacts).	
Moka	Brownfield (night club)	3787.86373956	Part of 1,500 net dwellings	Allocation is located within River Mole catchment. Development will require increased discharges to WwTWs which discharge to the River Mole. Development is likely to increase pressure on public water supply abstraction from River Arun catchment. A change in water levels / water quality may affect habitats upon which species rely. Alone LSEs due to changes in water quality and water quantity are expected at: - Mole Gap to Reigate Escarpment SAC. - Arun Valley SAP/SAC/Ramsar.	Potential LSEs from all Local Plan allocations combined and in-combination with other plans and projects include: - Air Quality at Ashdown Forest SAC/SPA and Mole Gap to Reigate Escarpment SAC. - Hydrology impacts at Mole Gap to Reigate Escarpment SAC, Arun Valley SPA/SAC/Ramsar and The Mens SAC (knock on habitat loss / fragmentation impacts).	Screened in Category I and L.

Housing Sites – Policy H2 - Housing and Open Space Sites

Site Name	Current site use	Area (sqm)	Housing number / proposed employment use	Hydrological link to a Habitats site	In-combination effect	Screening conclusion
Tinsley Lane Playing Fields	Greenfield (playing fields)	59747.3069961	120	Allocation is located within River Mole catchment. Pond (potentially linked to Gatwick Stream) on opposite side of railway track approx. 220m to east. Development will require increased discharges to WwTWs which discharge to the River Mole. Development is likely to increase pressure on public water supply abstraction from River Arun catchment. A change in water levels / water quality may affect habitats upon which species rely. Alone LSEs due to changes in water quality and water quantity are expected at: - Mole Gap to Reigate Escarpment SAC. - Arun Valley SAP/SAC/Ramsar.	Potential LSEs from all Local Plan allocations combined and in-combination with other plans and projects include: - Air Quality at Ashdown Forest SAC/SPA and Mole Gap to Reigate Escarpment SAC. - Hydrology impacts at Mole Gap to Reigate Escarpment SAC, Arun Valley SPA/SAC/Ramsar and The Mens SAC (knock on habitat loss / fragmentation impacts).	Screened in Category I and L.
Breezehurst Drive Playing Fields	Greenfield (playing fields)	27372.6619158	85	Allocation is located within River Mole catchment. Dauster Brook running along western site boundary. Development will require increased discharges to WwTWs which discharge to the River Mole. Development is likely to increase pressure on public water supply abstraction from River Arun catchment. A change in water levels / water quality may affect habitats upon which species rely. Alone LSEs due to changes in water quality and water quantity are expected at:	Potential LSEs from all Local Plan allocations combined and in-combination with other plans and projects include: - Air Quality at Ashdown Forest SAC/SPA and Mole Gap to Reigate Escarpment SAC.	Screened in Category I and L.

				- Mole Gap to Reigate Escarpment SAC. - Arun Valley SAP/SAC/Ramsar.	- Hydrology impacts at Mole Gap to Reigate Escarpment SAC, Arun Valley SPA/SAC/Ramsar and The Mens SAC (knock on habitat loss / fragmentation impacts).	

Housing Sites – Policy H2 - Housing for Older People and those with Disabilities

Site Name	Current site use	Area (sqm)	Housing number / proposed employment use	Hydrological link to a Habitats site	In-combination effect	Screening conclusion
Oakhurst Grange	Brownfield (cleared site, formerly nursing home)	14849.629619	55	Allocation is located within River Mole catchment. Development will require increased discharges to WwTWs which discharge to the River Mole. Development is likely to increase pressure on public water supply abstraction from River Arun catchment. A change in water levels / water quality may affect habitats upon which species rely. Alone LSEs due to changes in water quality and water quantity are expected at: - Mole Gap to Reigate Escarpment SAC. - Arun Valley SAP/SAC/Ramsar.	Potential LSEs from all Local Plan allocations combined and in-combination with other plans and projects include: - Air Quality at Ashdown Forest SAC/SPA and Mole Gap to Reigate Escarpment SAC. - Hydrology impacts at Mole Gap to Reigate Escarpment SAC, Arun Valley SPA/SAC/Ramsar and The Mens SAC (knock on habitat loss / fragmentation impacts).	Screened in Category I and L.
St. Catherine's Hospice	Brownfield (hospice)	7292.06967695	60	Allocation is located within River Mole catchment. Development will require increased discharges to WwTWs which discharge to the River Mole. Development is likely to increase pressure on public water supply abstraction from River Arun catchment. A change in water levels / water quality may affect habitats upon which species rely.	Potential LSEs from all Local Plan allocations combined and in-combination with other plans and projects include: - Air Quality at Ashdown Forest SAC/SPA and Mole Gap	Screened in Category I and L.

				Alone LSEs due to changes in water quality and water quantity are expected at: - Mole Gap to Reigate Escarpment SAC. - Arun Valley SAP/SAC/Ramsar.	to Reigate Escarpment SAC. - Hydrology impacts at Mole Gap to Reigate Escarpment SAC, Arun Valley SPA/SAC/Ramsar and The Mens SAC (knock on habitat loss / fragmentation impacts).	

Housing Sites – Policy H2 - Housing, Biodiversity and Heritage Site

Site Name	Current site use	Area (sqm)	Housing number / proposed employment use	Hydrological link to a Habitats site	In-combination effect	Screening conclusion
Land East of Balcombe Road/Street Hill	Greenfield	17545.057975	15	Allocation is located within River Mole catchment. Tributary of Gatwick Stream running along southern site boundary. Development will require increased discharges to WwTWs which discharge to the River Mole. Alone LSEs due to changes in water quality and water quantity are expected at: - Mole Gap to Reigate Escarpment SAC. This allocation is not located within the Sussex North WRZ.	Potential LSEs from all Local Plan allocations combined and in-combination with other plans and projects include: - Air Quality at Ashdown Forest SAC/SPA and Mole Gap to Reigate Escarpment SAC. - Hydrology impacts at Mole Gap to Reigate Escarpment SAC	Screened in Category I and L.

Policy H8: Gypsy, Traveller and Travelling Showpeople

Site Name	Current site use	Area (sqm)	Housing number / proposed employment use	Hydrological link to a Habitats site	In-combination effect	Screening conclusion
Broadfield Kennels	Greenfield	29067.13781050000	10 pitches	Allocation is located within River Mole catchment. Development will require increased discharges to WwTWs which discharge to the River Mole. Development is likely to increase pressure on public water supply abstraction from River Arun catchment. A change in water levels / water quality may affect habitats upon which species rely. Alone LSEs due to changes in water quality and water quantity are expected at: - Mole Gap to Reigate Escarpment SAC. - Arun Valley SAP/SAC/Ramsar.	Potential LSEs from all Local Plan allocations combined and in-combination with other plans and projects include: - Air Quality at Ashdown Forest SAC/SPA and Mole Gap to Reigate Escarpment SAC. - Hydrology impacts at Mole Gap to Reigate Escarpment SAC, Arun Valley SPA/SAC/Ramsar and The Mens SAC (knock on habitat loss / fragmentation impacts).	Screened in Category I and L.

Habitat Regulations Assessments

Sustainability Appraisals

Strategic Environmental Assessments

Landscape Character Assessments

Landscape and Visual Impact Assessments

Green Belt Reviews

Expert Witness

Ecological Impact Assessments

Habitat and Ecology Surveys

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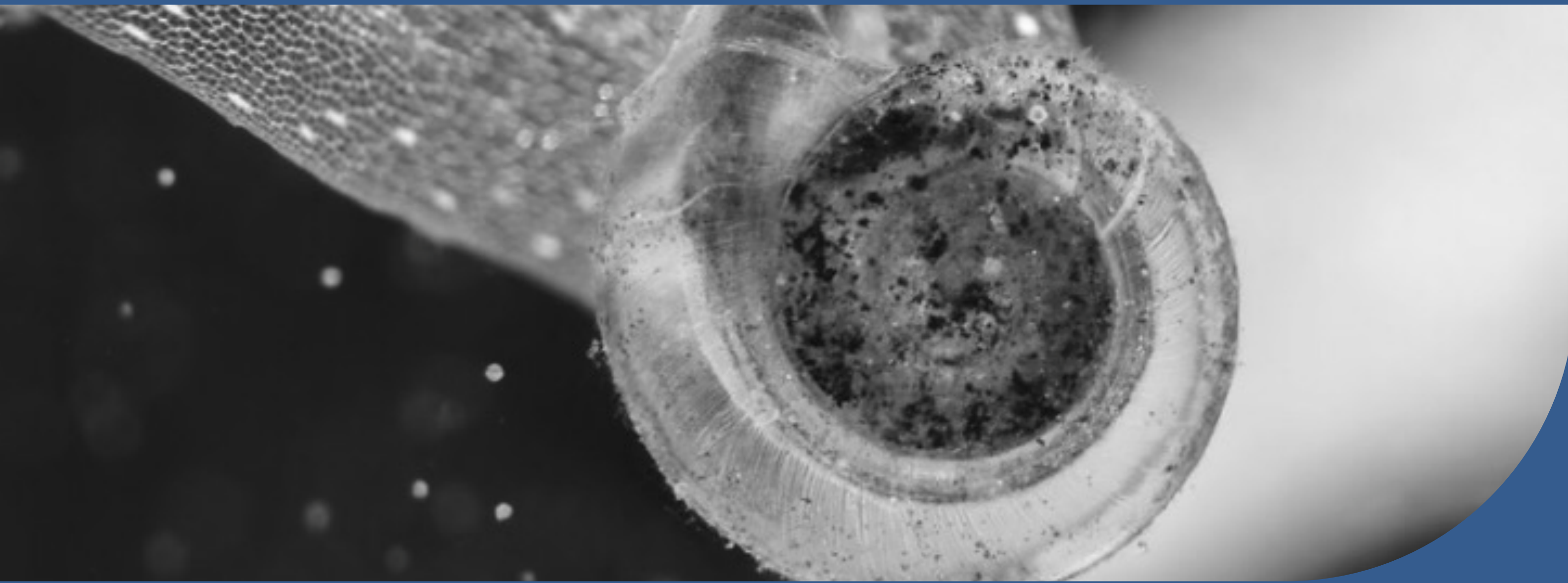

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