ED20

Winchester Local Plan Habitats Regulations Assessment

HRA Supplementary Information: Air Quality at SAC Compensatory Habitats

Winchester City Council

Final report
Prepared by LUC
March 2025

Version	Status	Prepared	Checked	Approved	Date
1	Draft report	K Sydney	D Green	D Green	14.02.2025
2	Final report	K Sydney	K Sydney	D Green	19.02.2025
3	Updated final report (minor edits with final AQA)	K Sydney	J Pearson	J Pearson	14.03.2025

Land Use Consultants Limited

Registered in England. Registered number 2549296. Registered office: 250 Waterloo Road, London SE1 8RD. Printed on 100% recycled paper

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Chapter 1

Introduction

1.1 This report is supplementary to the HRA addendum that was prepared in November 2024 (Local Plan library reference SD04a) to address comments raised by Natural England during the Reg.19 consultation and to present and assess further work undertaken since the July 2024 HRA. This report follows on from the November 2024 addendum, and presents additional information prior to the Local Plan Examination hearings.

1.2 Natural England's Reg.19 comments had advised that the Local Plan would be unsound as the air quality assessment in the HRA required further work to conclude 'no adverse effects on integrity'. The November 2024 addendum presented an assessment of air pollution on the River Itchen SAC. This concluded that there will be no adverse effects on the integrity of the SAC due to changes in traffic flows associated with Local Plan development. The air quality assessment work was then updated in December 2025 (library reference ED05) to clarify why some of the assessed roads show a decrease in traffic flows. In January 2025, Natural England confirmed in a letter (library reference ED04) that *"Following receipt of the Air Quality Assessment Natural England can confirm that the reasons for which we advised the Local Plan would not pass the tests of soundness have been resolved."*

1.3 In relation to SAC Compensatory Habitats (designated to off set harm to the River Itchen SAC caused by water abstraction by Southern Water), adverse effects due to air pollution could not be ruled out in the November 2024 addendum. The addendum identified 13 roads (within 200m of) the SAC Compensatory Habitats to require further assessment:

1.4 River Meon – from East Meon (source) to Solent at Titchfield Haven:

- A32 from West Meon to Wickham: runs alongside the river (<200m) for most of this length;

- A334 at Wickham: crosses the river;
- M27 between jcn9 & jcn10: crosses the river; and
- A27 between B3334 and Mill Lane: crosses the river.

1.5 The air quality assessment also considered the B2177 at Wickham, which links to the A32 at Wickham and crosses the Meon.

1.6 River Dever – from West Stratton (source) to River Test at Wherwell:

- A33 & M3 at West Stratton: c.100m/170m respectively from source of river;
- A30 from Sutton Scotney to A34 at Bullington: runs alongside river (<200m) for most of this length; and
- A34 at Bullington: crosses the river.

1.7 Bourne Rivulet – from Swampton to River Test at Hursbourne Priors (rest is >10km from plan area):

- No A roads. B3048 runs alongside (<200m) for much of this length.

1.8 River Dun – from East Dean to River Test at Kimbridge (rest is >10km from plan area):

- No A road. East Dean Road and Lockerley Road run alongside (<200m) for much of this length.

1.9 Middle River Test between Wherwell and Kimbridge/Mottisfont:

- A3057 from Chilbolton to Stockbridge: runs alongside (<200m) for much of this length;
- A30 at Stockbridge: crosses (several braids of) the river; and
- A3057 from Compton to Kimbridge: runs alongside (<200m) for much of this length.

1.10 (Note that this list has since been refined; see explanation in paragraph 2.8. Assessed roads are shown on maps in the air quality assessment, which is presented in full in Appendix A.)

1.11 The November 2024 addendum stated that:

> "The Council is currently obtaining traffic data for these roads, so that the potential impacts of air pollution on the Compensatory SACs can be screened. It is considered likely that, because the Local Plan as a whole and in combination does not result in significant increases in traffic at the River Itchen SAC (which is next to the M3 and close to many of the Local Plan's site allocation), that traffic on the roads close to the Compensatory SACs, most of which are outside the plan area, will not be significant. However, this will be confirmed once the traffic data is available. If there are significant increases in traffic on these roads due to the Local Plan, an air quality assessment will be undertaken and the approach and results discussed with Natural England. This will be addressed in an updated addendum to the HRA which will be submitted prior to the Local Plan Hearings."

1.12 Through discussions with Natural England, it was confirmed that the qualifying feature of the SAC Compensatory Habitats 'Water courses of plain to montane levels with *R. fluitantis'* (chalk stream habitat) is sensitive to nitrogen oxides (NOx) and ammonia (NH_3). Atlantic salmon, which are a qualifying feature of the River Meon Compensatory SAC are not sensitive to local changes in air pollution, due to their migratory lifecycle.

1.13 The traffic data and air quality assessment prepared to assess the impact of traffic on roads within 200m of the SAC Compensatory Habitats are presented in Chapter 2 and Appendix A. The implications of these are presented in Chapter 3.

1.14 This assessment is set out with reference to Natural England guidance **[See reference 1]** on assessing vehicle emissions in HRA:

- Step 1: Does the proposal give rise to emissions which are likely to reach a Habitats Site?
- Step 2: Are the qualifying features of sites within 200m of a road sensitive to air pollution?
- Step 3: Could the sensitive qualifying features of the site be exposed to emissions?
- Step 4: Application of screening thresholds, alone (4a) and in-combination (4b and 4c).
- Step 5: Appropriate Assessment where thresholds are exceeded, either alone or in-combination.

Chapter 2

Air quality assessment

2.1 An air quality assessment has been carried out by Air Quality Assessments Ltd and is provided in Appendix A. Key findings relevant to the HRA are presented in this chapter, along with a summary of traffic data provided by Winchester City Council.

Traffic data and roads considered

2.2 Traffic data was provided by Winchester Council, based on traffic data and modelling scenarios from the Winchester Local Plan Strategic Transport Assessment **[See reference** 2**]**. These are the same modelling scenarios that were used in the assessment of air pollution at the River Itchen SAC in the November 2024 HRA addendum.

2.3 Two roads in proximity to the River Meon were able to be screened out on the basis of the traffic data as the Local Plan will result in a reduction in traffic flows: M27 between junctions 9 & 10; and A27 between B3334 and Mill Lane.

2.4 All other roads were screened in as the traffic data show that there would be an increase of >1,000 AADT, from the Local Plan in combination with other plans/projects, within 200m of the SAC Compensatory Habitats.

The information presented above (and in Chapter 1) provides answers to Steps 1-3 of the Natural England guidance:

- Step 1: Does the proposal give rise to emissions which are likely to reach a European site? Yes, Local Plan will increase traffic on roads within the plan area. Traffic screening criteria is in the in-combination scenario on several roads.

- Step 2: Are the qualifying features of sites within 200m of a road sensitive to air pollution? Yes, the qualifying features of the SAC Compensatory Habitats are sensitive to nitrogen oxides (NOx) and ammonia (NH_3).
- Step 3: Could the sensitive qualifying features of the site be exposed to emissions? Yes, the SAC Compensatory Habitats are within 200m of roads on which traffic will exceed the 1,000 AADT screening criteria.

2.5 Some of the roads that pass within 200m of the SAC Compensatory Habitats are outside the area modelled by Winchester City Council. In these cases, data from ‘proxy’ roads within the model were used. The proxy roads are roads that lead from the plan area towards the SAC Compensatory Habitats and provide a good approximation of the traffic that would reach the roads past the SAC Compensatory Habitats.

2.6 Roads outside the model and the proxy roads used are:

- Bourne – B3048 Swampton to Hurbourne Priors: A34 north of Sutton Scotney
- Dun – East Dean Road & Lockley Road: B3084 south of Kimbridge
- Middle Test – A3057 Chilbolton to Stockbridge: A3057 at Kimbridge (same road further south)
- Middle Test – A30 at Stockbridge: no data as there are major junctions between proxy roads and assessment area. However, other roads within the plan area e.g. A3057, which runs alongside the River Test, are considered to be a worst case.

2.7 The air quality assessment (Appendix A) refers to the roads assessed as ‘A-L’ and identifies transects near to these roads. Some roads have more than one transect, for example if the road crosses a river (transect on either side of the road) or runs alongside a river (may be several transects).

2.8 The roads and transects are at the following locations and SAC Compensatory Habitats:

- Road A, transects Dun 1-4: B3084 – south of Kimbridge – River Dun (proxy for East Dean Road and Lockerley Road)
- Road B, transects Test 1-6: A3057 – at Kimbridge – Middle Test (alongside river in the south, proxy for same road further north)
- Road C, transects Test 1-6, : A3057 – at Kimbridge – Middle Test (alongside river in the south, proxy for same road further north)
- Road D, transects Dever 2-11: A30 – Sutton Scotney to A34 at Bullington – River Dever (alongside river)
- Road E, transects Dever 2-9: A34 – north of Sutton Scotney – River Dever (crosses river but also close to A30 transects)
- Road F, transect Dever 1: A33 – at West Stratton – River Dever (near river source)
- Road G, transect Dever 1: M3 - at West Stratton – River Dever (near river source)
- Road H, transects Meon 8-17: A32 – West Meon to south of Droxford – River Meon (alongside river)
- Road I, transects Meon 5-7: A32 – south of Droxford to near Wickham – River Meon (alongside river)
- Road J, transects Meon 5-7: A32 – near Wickham – River Meon (alongside river)
- Road K, transects Meon 1-5: A334 – at Wickham – River Meon (crosses river)
- Road L, transect Meon 5: B2177 – at Wickham – River Meon (crosses river)

Summary of air quality assessment

2.9 Critical levels used in the air quality assessment were 30µgNOx/m^3 for nitrogen oxides and 3µgNH3/m^3 for ammonia.

Air quality baseline

2.10 In the assessment of the current and future baseline air quality, annual mean NOx concentrations are predicted to be above the NOx critical level at receptors closest to the road sources in 2019 at River Dever receptors Dever 2 to Dever 9; however, due to the projected increase in the proportion of lower emission vehicles in the UK fleet and the associated decrease in background concentrations, by 2041 the critical level is predicted to be achieved by a wide margin. Annual mean NH3 concentrations are predicted to be below the NH3 critical level at all receptors in 2019; however, the critical level is exceeded at River Dever receptors Dever 2, Dever 4 and Dever 5 in 2041. All other transect locations are below the critical levels for both pollutants.

Effect of Local Plan alone

2.11 The Local Plan in isolation does not lead to any exceedances of the 1% screening threshold for NOx or NH3 at the receptors closest to the road sources.

2.12 The Local Plan results in an increase in AADT on most road links within 200m of the receptors, but a decrease on the M3 and the A34 where they pass over the River Dever. There is a small increase in AADT on the A33 and A30 where they pass over the River Dever. The net result of the increases and decreases in AADT on the roads affecting the River Dever at these locations is an improvement in air quality at some receptors (Dever 1 to Dever 5) because the reduction in emissions due to decreases in traffic on the M3 and A34 more than offsets increased emissions on other nearby roads. The Local Plan in isolation results in lower concentrations/deposition rates when compared with baseline concentrations/deposition rates at these receptors; therefore, there is a marginal improvement in air quality at these River Dever receptors. Therefore, any in-combination effect at receptors Dever 1 to Dever 5 would be due to in-combination sources only, i.e. the Local Plan does not contribute to a deterioration in air quality.

Effect of Local Plan in combination

2.13 For NOx, there are exceedances of the 1% screening threshold at some receptors (Test 3, 5 & 6; and Dun 3 & 4), when Local Plan traffic is considered in combination with traffic from other sources. However, when emissions from all sources are added to the future baseline pollutant levels, they are still well below the critical level for the affected habitat because of the overall trend of decreasing NOx emissions. The air quality assessment has confirmed that the Local Plan will not hinder progress towards achieving the SAC's 'restore' Conservation Objective for air quality.

2.14 For NH_3, no receptors have been identified where the in-combination impact is above the 1% screening threshold, and the impact from the in-combination sources on their own is also below the 1% screening threshold.

The information presented above provides answers to Step 4 of the Natural England guidance:

- Step 4: Application of screening thresholds (4a alone; 4b & 4c in combination): The Local Plan does not exceed the screening thresholds for NOx of NH_3 alone (4a). The Local Plan 'in combination' exceeds the screening thresholds for NOx but not NH_3 (4b and 4c).

Chapter 3

Implications of air quality assessment for HRA

3.1 The air quality assessment has found that there are not exceedances of the air pollution screening threshold (1% of critical level) for ammonia. The effects of ammonia from Local Plan traffic on the SAC Compensatory Habitats can therefore be screened out.

3.2 For NOx, there are some exceedances of the screening threshold on roads within 200m of the River Test and River Dun, therefore impacts of NOx are screened in for the SAC Compensatory Habitats in these locations, and Appropriate Assessment is required. However, when the in-combination effects on NOx are added to the future baseline (which takes into account declining vehicle emissions over the plan period), pollutant levels are well below the critical levels for the affected habitat. The SAC Compensatory Habitat qualifying feature 'Water courses of plain to montane levels with R. fluitantis' (chalk stream habitat) will therefore not be significantly affected and adverse effects on its integrity can be ruled out.

3.3 No traffic data was available for the A30 at Stockbridge. However, this road crosses the River Test at Stockbridge, whereas the A3057 runs alongside the River Test (i.e. potential pollution source along more of the river) and the A3057 is considered to be a worst case scenario. The A3057, like other transects assessed, will not have an adverse effect on the integrity of the SAC Compensatory Habitats due to air pollution.

The information presented above provides answers to Step 5 of the Natural England guidance:

- Step 5: Advise on the need to Appropriate Assessment where thresholds are exceeded, either alone or in-combination. Appropriate

Assessment is required as the screening threshold for NOx is exceeded in combination. The Appropriate Assessment concludes that there will be no adverse effect on the integrity of the SAC Compensatory Habitats due to air pollution.

Appendix A

Air quality assessment report

Air Quality Assessment	
HRA Compensatory Habitats, Winchester	
Job number:	J0937
Document number:	J0937/1/F2
Date:	06 March 2025
Client:	Winchester City Council
Prepared by:	Mr Bob Thomas

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1 Introduction

1.1. Background

1.1.1 Air Quality Assessments Ltd (AQA) has been commissioned by Winchester City Council to assess the air quality effects of the Winchester Local Plan 2020-2040 (referred to as the "Local Plan" from now on) on compensatory habitat associated with the River Itchen Special Area of Conservation (SAC), which forms part of the UK National Site Network. Winchester City Council became aware of the compensatory habitats following the Regulation 19 consultation on the Local Plan and an advisory letter from Natural England, dated 22nd November 2024.

1.1.2 Compensatory habitat performs a compensatory function for protected features of the UK National Site Network. Sites identified as providing compensatory measures for adverse effects on designated SACs are given the same protection as the UK National Site Network.

1.1.3 Compensatory measures are considered necessary to offset potential adverse effects on the integrity of the River Itchen SAC due to Drought Orders authorised at the request of Southern Water, which would abstract water from the River Itchen. The following rivers that provide compensatory measures may be affected by the Local Plan:

- River Dever;
- River Dun;
- River Test; and
- River Meon.

1.1.4 An initial screening using traffic data provided by SYSTRA, using the Solent Transport Sub Regional Transport Model (SRTM), which was used to inform the Strategic Transport Assessment, has identified roads where the Local Plan, in-combination with other plans and projects, could increase traffic by more than 1,000 annual average daily traffic (AADT). Compensatory habitat within 200m of these roads may be affected by road traffic emissions, as advised in Natural England's Approach to Advising Competent Authorities on the Assessment of Road Traffic Emissions under the Habitats Regulations (Natural England, 2018). The increase in emissions due to the additional Local Plan in-combination traffic may have an adverse effect on the compensatory habitat.

1.1.5 The following roads, where the Local Plan in-combination could increase traffic by more than 1,000 AADT, have been identified within 200m of the compensatory habitat:

- B2177;
- B3084;
- A30;
- A32;
- A33;
- A34;

- A334;
- A3057; and
- M3.

1.2. Scope of Assessment

1.2.1 This report describes the existing air quality conditions at the compensatory habitat and assesses the likely impact that traffic generated by the Local Plan will have on air quality. The main air pollutants of concern related to road traffic emissions are ammonia (NH_3), nitrogen oxides (NOx), nutrient nitrogen deposition and acid nitrogen deposition. The assessment has been undertaken for the 2041 SRTM forecast year.

1.2.2 The assessment has been prepared taking into account all relevant local and national guidance and regulations and informs the Appropriate Assessment undertaken by Land Use Consultants Limited (LUC), completed with regard to Natural England's Guidance on Assessing Road Traffic Emission under the Habitats Regulations (Natural England, 2018).

1.2.3 This assessment has been completed with regard to the consultation response from Natural England on the Proposed Submission Winchester Local Plan 2020-2040. Natural England stated the following in their responses to the Plan Habitats Regulations Assessment in relation to compensatory habitat:

"Natural England has advised the Council that the River Meon and River Dever are Page 3 of 15 being considered as compensatory habitat for Southern Water's Drought Plan. At the point the Drought Order is enacted the River Meon will be considered as the River Itchen Compensatory Habitat SAC, similarly the River Dever will become the River Test Compensatory Habitat SAC. This should be taken forward for consideration in the Plan HRA."

2 Air Quality Legislation & Planning Policy

2.1. Air Quality Legislation

2.1.1 European Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the "Habitats Directive") requires member states to introduce a range of measures for the protection habitats and species. The Conservation of Habitats and Species Regulations 2017 (as amended) transposes the Directive into law in England and Wales (The Stationary Office, 2017).

2.1.2 The United Kingdom left the European Union on 31st January 2020 and amendments to the Habitats Regulations have transferred functions from the European Commission to the appropriate authorities in England and Wales and SACs and Special Protection Areas (SPAs) now form part of the UK National Site Network.

2.1.3 The Habitats Regulations require the competent authority, which in this case is Winchester City Council, to firstly evaluate whether plans are likely to give rise to a significant effect on Habitats Regulations sites. Where this is the case, it has to carry out an 'appropriate assessment' in order to determine whether the plans will adversely affect the integrity of the site.

2.1.4 The Air Quality Standards Regulations 2010 (as amended) set legally binding limit values for concentrations of major air pollutants in outdoor air that impact public health and vegetation, including a critical level for NOx (The Stationary Office, 2010). The critical level for NOx is an annual mean concentration of 30µg/m^3. Achievement of the critical levels is a national obligation rather than a local one. The critical levels only apply at sites more than 20 km from agglomerations, or more than 5 km away from other built up areas, industrial installations or motorways or major roads with traffic counts of more than 50,000 vehicles a day.

2.1.5 Part IV of The Environment Act 1995, as amended by the Environment Act 2021, requires the UK Government to prepare a national Air Quality Strategy. A new Air Quality Strategy for England was published in April 2023 (Defra, 2023). The Air Quality Strategy sets out the actions that Defra expects local authorities to take in support of long-term air quality goals and provides a framework to enable local authorities to make the best use of their powers and make improvements for their communities.

2.1.6 The strategy sets out air quality standards and objectives intended to protect human health and the environment. Standards are the concentrations of pollutants in the atmosphere, below which there is a minimum risk of health effects or ecosystem damage; they are set with regard to scientific and medical evidence. Objectives are the policy targets set by the Government, taking account of economic efficiency, practicability, technical feasibility and timescale, where the standards are expected to be achieved by a certain date. The Government has also published a Clean Air Strategy, which provides an overview of the actions that the government will take to improve air quality (Defra, 2019). The actions in the Clean Air Strategy focus on emissions from transport, the home, farming, and industry.

2.1.7 The national air quality objective for NOx is an annual mean of 30µg/m^3, which is the same as the critical level; however, the compliance date by which the objective must be achieved, and maintained thereafter, is 31st December 2000.

2.1.8 The national objective only strictly applies away from urban areas and heavily trafficked roads; however, Natural England has adopted a precautionary approach and applies the objective across all Habitats Regulations sites.

2.2. National Policies

2.2.1 The National Planning Policy Framework (NPPF) sets out the Government's planning policies for England and how these should be applied (Ministry of Housing, Communities & Local Government, 2024). It provides a framework within which locally prepared plans for development can be produced. At Paragraph 8c, the NPPF states that the purpose of the planning system is to contribute to the achievement of sustainable development and includes an overarching environmental objective:

"To protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy."

2.2.2 With regard to environmental impacts from traffic, the NPPF states at Paragraph 109 that:

"Transport issues should be considered from the earliest stages of plan-making and development proposals, using a vision-led approach to identify transport solutions that deliver well-designed, sustainable and popular places. This should involve:

f) identifying, assessing and taking into account the environmental impacts of traffic and transport infrastructure – including appropriate opportunities for avoiding and mitigating any adverse effects, and for net environmental gains.

2.2.3 The NPPF states at Paragraph 187 that:

"Planning policies and decisions should contribute to and enhance the natural and local environment by: …

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; …"

2.2.4 The NPPF goes on to state at Paragraph 198:

"Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development."

2.2.5 With specific reference to air quality, the NPPF states at Paragraph 199 that:

"Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan."

2.2.6 The NPPF also includes the following statement at Paragraph 201:

"The focus of planning policies and decisions should be on whether proposed development is an acceptable use of land, rather than the control of processes or emissions (where these are subject to separate pollution control regimes). Planning decisions should assume that these regimes will operate effectively. Equally, where a planning decision has been made on a particular development, the planning issues should not be revisited through the permitting regimes operated by pollution control authorities."

2.2.7 The NPPF is supported by air quality national Planning Practice Guidance (nPPG) (Ministry of Housing, Communities & Local Government, 2019). The PPG states that:

"The Department for Environment, Food and Rural Affairs carries out an annual national assessment of air quality using modelling and monitoring to determine compliance with relevant Limit Values. It is important that the potential impact of new development on air quality is taken into account where the national assessment indicates that relevant limits have been exceeded or are near the limit, or where the need for emissions reductions has been identified."

2.2.8 The PPG also states:

"Air quality considerations may also be relevant to obligations and policies relating to the conservation of nationally and internationally important habitats and species."

2.2.9 With regard to development plans, the PPG states that:

"It is important to take into account air quality management areas, Clean Air Zones and other areas including sensitive habitats or designated sites of importance for biodiversity where there could be specific requirements or limitations on new development because of air quality. Air quality is also an important consideration in habitats assessment, strategic environmental assessment and sustainability appraisal which can be used to shape an appropriate strategy, including through establishing the 'baseline', appropriate objectives for the assessment of impacts and proposed monitoring."

2.2.10 The PPG goes on to state that:

"Whether air quality is relevant to a planning decision will depend on the proposed development and its location. Concerns could arise if the development is likely to have

an adverse effect on air quality in areas where it is already known to be poor, particularly if it could affect the implementation of air quality strategies and action plans and/or breach legal obligations (including those relating to the conservation of habitats and species). Air quality may also be a material consideration if the proposed development would be particularly sensitive to poor air quality in its vicinity."

2.2.11 The PPG also sets out the information that may be required in an air quality assessment, stating that:

"Assessments need to be proportionate to the nature and scale of development proposed and the potential impacts (taking into account existing air quality conditions), and because of this are likely to be locationally specific."

2.2.12 It also provides guidance on options for mitigating air quality impacts, and makes clear that:

"Mitigation options will need to be locationally specific, will depend on the proposed development and need to be proportionate to the likely impact."

3 Methodology

3.1. Natural England Guidance

3.1.1 Natural England have published internal guidance to assist their staff when giving advice to competent authorities undertaking assessment of road traffic impacts under the Habitats Regulations (Natural England, 2018). The following methodology ensures that the competent authority is able to reach a conclusion with regards to air quality in the Habitats Regulations Assessment.

3.2. Baseline Conditions

3.2.1 Information on background NOx and NH_3 concentrations and nutrient and acid nitrogen deposition at the receptor locations have been collated from the following sources:

- Background pollutant concentration maps published by Defra (Defra, 2025). These cover the whole country on a 1 x 1 km grid; and
- Background ammonia concentrations and nitrogen deposition fluxes published by the Air Pollution Information System (APIS, 2025).

3.2.2 Background concentrations of NOx are provided by Defra to support local authorities carrying out their duties under Local Air Quality Management (LAQM) and include projections up to 2040 only. Therefore, the 2041 background NOx concentrations required to align with the SRTM modelling scenarios (see **Paragraph 3.3.2**) are assumed to be the same as in 2040.

3.2.3 Background concentrations of NH_3 and nitrogen deposition rates are provided by APIS for an average of 2020-22, with no future projections. Therefore, background NH_3 concentrations and nitrogen deposition rates in 2041 are assumed to be the same as the 2020-22 average.

3.3. Road Traffic Impacts

Sensitive Locations

3.3.1 Concentrations have been modelled at indicative receptors closest to the roads where the Local Plan in-combination is predicted to increase traffic flows by more than 1,000 AADT. Where roads cross the compensatory habitat, receptors have been modelled at the point of the habitat closest to the road, and at 5m from the road. Full details of the receptor locations are provided in in **Table A1** in **Appendix A1**. An overview of the receptor locations is shown in **Figure 1**, with smaller scale maps provided in **Figure 2** to **Figure 11** in **Appendix A1**.

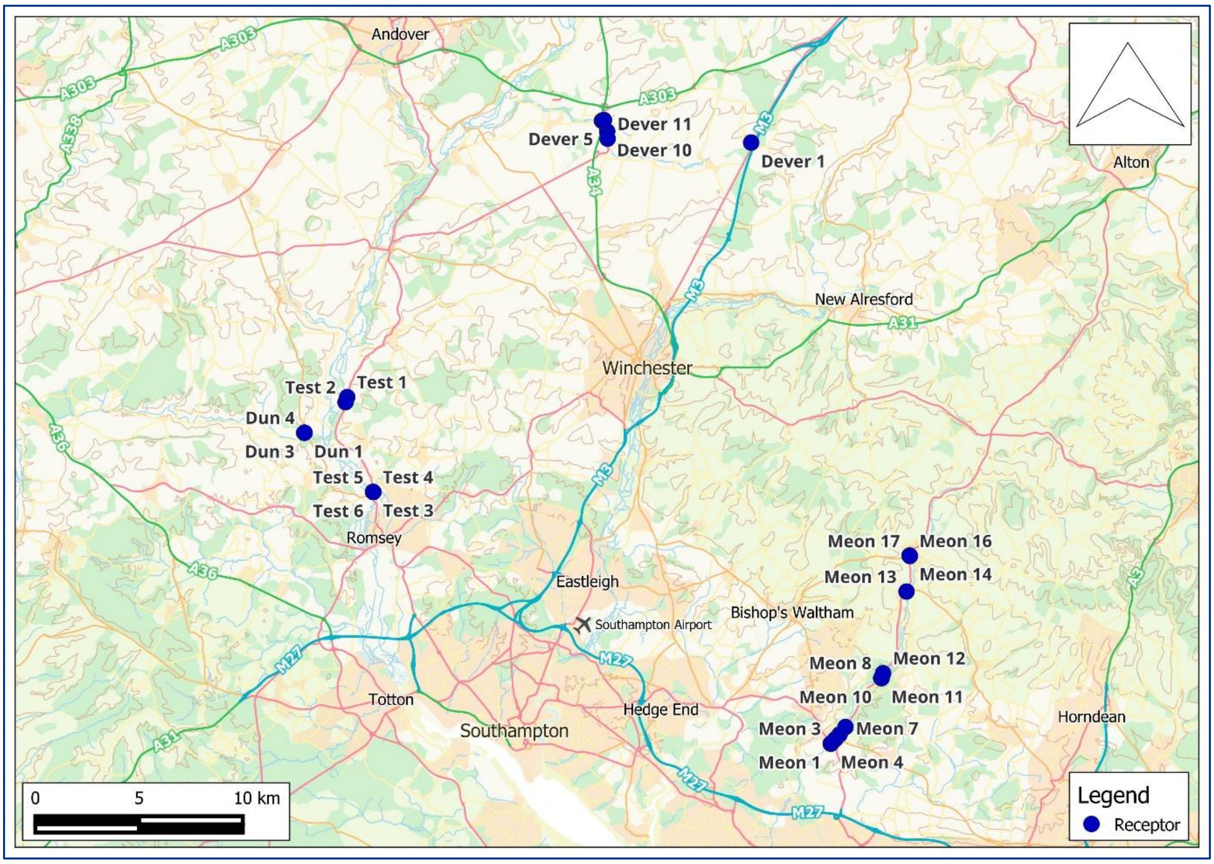

Figure 1: Receptor Locations

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Assessment Scenarios

3.3.2 Concentrations of NOx and NH_3 have been predicted for the following scenarios, from the SRTM modelling scenarios for the Local Plan Strategic Transport Assessment (Hampshire Services, 2024):

- 2019, the SRTM base year and air quality model verification year;
- 2041 Baseline (no Winchester Local Plan development except for committed sites); and
- 2041 with the Winchester Local Plan (which is the Do Minimum scenario in the Local Plan Strategic Transport Assessment).

3.3.3 A full description of each SRTM modelling scenario is available in the Local Plan Strategic Transport Assessment. The SRTM Do Minimum scenario assumes that, outside of Winchester, development growth is in line with the adopted Local Plans for the respective neighbouring authorities; therefore, a comparison with the Baseline scenario provides an assessment of the Local Plan air quality impact in isolation.

3.3.4 Contributions to future road transport emissions close to the compensatory habitat will be due to many projects and plans. The SRTM 2041 Baseline scenario includes all committed development and infrastructure within Winchester District through to 2041, as well as growth due to Neighbouring Authorities adopted Local Plans. These in-combination emissions sources would need to be removed from the 2041 baseline in order to determine the in-combination effect of these emissions sources with the Local Plan. Therefore, concentrations have been predicted for an additional 2041 baseline scenario that uses the 2019 SRTM base year traffic data with 2041 vehicle emissions and background concentrations. This provides an alternative 2041 no growth baseline against which to compare the 2041 with Local Plan scenario. A comparison of the 2041 with Local Plan scenario with this alternative 2041 no growth future baseline provides an assessment of the Local Plan air quality impact in-combination.

Modelling Methodology

3.3.5 Concentrations have been predicted using the ADMS Roads (v5.0.1.3) dispersion model (CERC, 2025). The model requires the input of a range of data, details of which are provided in **Appendix A1**, along with details of the model verification calculations.

Uncertainty

3.3.6 There are many factors that contribute to uncertainty when predicting pollutant concentrations. The emission factors utilised in the air quality model are dependent on traffic data, which have inherent uncertainties associated with them. There are also uncertainties associated with the model itself, which simplifies real world conditions into a series of algorithms. The model verification process, as described in **Appendix A1**, minimises the uncertainties; however, future year predictions use projected traffic data, emissions data, and background concentrations. The most recent emission factors and background data published by Defra and APIS have been used in this assessment.

3.4. Assessment Criteria and Significance

3.4.1 Critical levels are defined as concentrations of pollutants in the atmosphere above which direct adverse effects on plants or ecosystems may occur according to present knowledge. A critical level is the gaseous concentration of a pollutant in the air. Critical levels are not habitat specific, but have been set to cover broad vegetation types, with an ammonia annual mean critical level of 3µg/m^3 set for higher plants, and 1µg/m^3 set where sensitive lichens and bryophytes are an important part of the ecosystem integrity. The critical level for NOx is the 30µg/m^3 annual mean national air quality objective.

3.4.2 Environment Agency online guidance also sets out a critical level for 24-hour NOx, which is a non-statutory level derived from the World Health Organisation (WHO) Air Quality Guidelines for Europe (WHO, 2000; Defra & EA, 2016). The WHO Guidelines state that:

"A strong case can be made for the provision of critical levels for short-term exposures. There are insufficient data to provide these levels with confidence at present, but current evidence suggests values of about 75 µg/m^3 for NOx … as 24-hour means."

3.4.3 Institute of Air Quality Management (IAQM) guidance on assessing air quality impacts on nature conservation sites states (IAQM, 2020):

"This IAQM guidance, therefore, recommends that only the annual mean NOx concentration is used in assessments unless specifically required by a regulator; for instance, as part of an industrial permit application where high, short term peaks in emissions, and consequent ambient concentrations, may occur."

3.4.4 Given the uncertainty associated with the short-term critical level for NOx and its non-statutory status, greater emphasis should be placed on the achievement of the annual mean NOx objective and an assessment of the impact on 24-hour NOx has not been included in this assessment.

3.4.5 Critical loads are defined as a 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. The critical load relates to the quantity of pollutant deposited from air to ground. Critical loads for nitrogen deposition onto sensitive ecosystems have been specified by the United Nations Economic Commission for Europe (UNECE).

3.4.6 It must be emphasised that an exceedance of the critical level/load does not provide a quantitative estimate of damage to an ecosystem, but only the *potential* for damage to occur.

3.4.7 The APIS GIS map tool provides site relevant critical levels and loads for designated conservation sites in the UK and Ireland (APIS, 2025). APIS has provided critical levels and loads for the River Itchen SAC interest features shown in **Table 1**.

3.4.8 The compensatory measures relate to effects on river features only, that may be affected by water abstraction. Therefore, the Northern wet heath and rich fen nitrogen critical load class habitats and the dwarf shrub heath acidity critical load class habitats will not be affected and the assessment has considered effects on the water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation interest feature of the River Itchen SAC only. There are no nutrient or acid nitrogen deposition critical loads provided for water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation and nutrient and acid nitrogen deposition are not considered further.

3.4.9 Therefore, the assessment of impacts on the compensatory habitat has been completed for impacts on the critical levels for NOx and NH_3 of 30µgNOx/m^3 and 3µgNH_3/m^3 respectively.

Table 1: Ammonia Critical Level and Nitrogen Critical Loads

Designated Conservation Site	Feature Name	N Critical Load Class	Acidity Critical Load Class	Critical Level		Critical Load	
				Annual Mean NOx (µg/m³)	Annual Mean NH_3 (µg/m³)	Nutrient N Deposition (kg/ha/yr)	Acid Deposition (Nmax) (keq/ha/yr)
River Itchen SAC	Coenagrion mercuriale	Northern wet heath: 'L' Erica tetralix dominated wet heath (lowland)	Dwarf shrub heath	No critical level has been assigned for this feature, please seek site specific advice	No critical level has been assigned for this feature, please seek site specific advice	5	0.922
		Rich fens	n/a	30	3	15	n/a
	Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation	No comparable habitat with established critical load estimate available	Freshwater	30	3	n/a	Not provided in APIS

3.4.10 The Habitats Regulations require a competent authority to undertake a Habitats Regulations Assessment (HRA) for development schemes that may harm Habitats Regulations sites. The HRA process includes screening and appropriate assessment stages. The screening stage of the HRA identifies whether there is a risk of significant adverse effects on a Habitats Regulations site, which would then require further detailed examination through an appropriate assessment. If risks that might undermine a site's conservation objectives can clearly be ruled out at the screening stage, a development scheme will have no likely significant effect and no appropriate assessment will be needed.

3.4.11 A HRA screening assessment has been undertaken to determine whether the competent authority, in this case Winchester City Council, would need to progress to an appropriate assessment. A pollutant process contribution (PC) due to the Local Plan road traffic emissions alone, or in-combination with other potentially polluting schemes, greater than 1% of the relevant critical level or load would trigger a likely significant effect (LSE), and an appropriate assessment would be required.

3.4.12 For the purposes of deciding whether an appropriate assessment is required, the screening decision should not take into account any mitigation measures, as ruled in the Irish High Court case 'People Over Wind'. Where an LSE is triggered, mitigation can be taken into account at the appropriate assessment stage.

3.4.13 NE guidance on advising competent authorities on the assessment of road traffic Emissions under the Habitats Regulations states that:

"In general terms, it is important for a competent authority to remember that the subject plan or project remains the focus of any in-combination assessment.

Therefore, it is Natural England's view that care should be taken to avoid unnecessarily combining the insignificant effects of the subject plan or project with the effects of other plans or projects which can be considered significant in their own right. The latter should always be dealt with by its own individual HRA alone. In other words, it is only the appreciable effects of those other plans and projects that are not themselves significant alone which are added into an in-combination assessment with the subject proposal (i.e., 'don't combine individual biscuits (=insignificant) with full packs (=significant)')."

3.4.14 Where the initial screening cannot rule out a likely significant effect, the predicted environmental concentration (PEC) has been provided. The PEC is the PC plus the concentration/deposition rate of the pollutant already present in the environment (the baseline concentration/deposition rate). The PEC can then be used in the appropriate assessment to determine whether the impact of the Local Plan would have an adverse effect on site integrity at the designated site. The integrity of a designated site is the coherence of its ecological structure and function, across its whole area that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was designated.

3.4.15 In their internal guidance on road traffic impacts under the Habitats Regulations, NE advise that no threshold value is applied at appropriate assessment, with the focus on detailed modelling and case specific professional judgement using a suite of tools and evidence. The competent authority would need to determine whether an adverse effect on site integrity can be ruled out with regard to the following:

- Whether the sensitive qualifying features of the site would be exposed to emissions;
- The Habitats Regulations site's conservation objectives;
- Whether or not there are current exceedances of the critical levels/loads;
- Background pollution and concentrations/deposition trends;
- Appropriate use of the critical levels/loads;
- The designated site in its national context;
- Site survey information;
- The evidence on small incremental impacts from nitrogen deposition;
- The spatial scale and duration of the predicted impact and the ecological functionality of the affected area;
- National, regional and local initiatives or measures which can be relied upon to reduce background levels at the site; and
- Measures to avoid or reduce the harmful effects of the plan or project on site integrity.

3.4.16 The IAQM, the professional body for air quality professionals, has set out the following opinion with regard to the use of the 1% screening threshold (IAQM, 2020):

"In the IAQM's opinion, the 1% and 10% screening criteria should not be used rigidly and, not to a numerical precision greater than the expression of the criteria themselves. Whilst it is straightforward to generate model results for the PC to any level of precision required, the accuracy of the result is much less certain and it is

unwise to place too much emphasis on whether the PC is 0.9% or 1.1%, for example. In practice, because the magnitude of impacts attributable to new sources is often around 1% of the criterion, a regulator may require the results to be presented at greater resolution, i.e. having one (or more) decimal places. The distinction here is between the presentation of the model results and the weight given to fine differences around the criterion itself in making a judgement."

3.4.17 An increase above the screening threshold of 0.1-0.4% of the critical load/level, i.e. 1.1% to 1.4%, would round to 1% of the screening threshold. Changes at this level of magnitude would be difficult to distinguish from normal fluctuations, such as those due to weather and emissions variations, and there would be a high level of uncertainty associated with the predicted change. Percentages have been presented to one decimal place and PECs provided at receptors where the process contribution is greater than 1.0% of the screening threshold; however, the competent authority would need to judge whether a process contribution of 1.1-1.4% of the screening threshold should trigger an appropriate assessment.

4 Baseline Conditions

4.1. Background Concentrations

4.1.1 Estimated background concentrations within the assessment area are shown in **Table 2**. The background NOx and NH_3 concentrations are below the critical levels at the receptors within the study area.

Table 2: Estimated Background Concentrations and Deposition Rates

Receptor	Annual Mean NOx (µg/m³)			Annual Mean NH_3 (µg/m³)	
	2019	2040	Critical Level	2020-22	Critical Level
Dever 1	16.3	5.1	30	1.32	3
Dever 2	17.6	5.0	30	1.46	3
Dever 3	17.6	5.0	30	1.46	3
Dever 4	17.6	5.0	30	1.46	3
Dever 5	17.6	5.0	30	1.46	3
Dever 6	17.6	5.0	30	1.46	3
Dever 7	17.6	5.0	30	1.46	3
Dever 8	17.6	5.0	30	1.46	3
Dever 9	17.6	5.0	30	1.46	3
Dever 10	14.9	4.9	30	1.49	3
Dever 11	14.9	4.9	30	1.49	3
Test 1	11.0	4.7	30	1.28	3
Test 2	11.0	4.7	30	1.28	3
Test 3	13.0	5.6	30	1.23	3
Test 4	13.0	5.6	30	1.23	3
Test 5	13.0	5.6	30	1.23	3
Test 6	13.0	5.6	30	1.23	3
Meon 1	17.3	7.5	30	0.94	3
Meon 2	17.3	7.5	30	0.94	3
Meon 3	17.3	7.5	30	0.94	3
Meon 4	17.3	7.5	30	0.94	3
Meon 5	17.3	7.5	30	0.94	3
Meon 6	17.3	7.5	30	0.94	3
Meon 7	15.3	7.2	30	0.92	3
Meon 8	14.0	6.5	30	0.97	3
Meon 9	14.0	6.5	30	0.97	3

Receptor	Annual Mean NOx (µg/m³)			Annual Mean NH_3 (µg/m³)	
	2019	2040	Critical Level	2020-22	Critical Level
Meon 10	14.0	6.5	30	0.97	3
Meon 11	14.0	6.5	30	0.97	3
Meon 12	14.0	6.5	30	0.97	3
Meon 13	12.7	5.9	30	0.97	3
Meon 14	12.2	5.5	30	1.06	3
Meon 15	12.2	5.5	30	1.06	3
Meon 16	12.2	5.5	30	1.06	3
Meon 17	12.2	5.5	30	1.06	3
Dun 1	11.1	4.7	30	1.35	3
Dun 2	11.1	4.7	30	1.35	3
Dun 3	11.1	4.7	30	1.35	3
Dun 4	11.1	4.7	30	1.35	3

4.2. Predicted Baseline Concentrations

4.2.1 Baseline concentrations and at the indicative receptors closest to the road sources are set out in **Table 3**.

4.2.2 Annual mean NOx concentrations are predicted to be above the NOx critical level at receptors closest to the road sources in 2019 at River Dever receptors Dever 2 to Dever 9; however, due to the projected increase in the proportion of lower emission vehicles in the UK fleet and the associated decrease in background concentrations, by 2041 the critical level is predicted to be achieved by a wide margin.

4.2.3 Annual mean NH_3 concentrations are predicted to be below the NH_3 critical level at all receptors in 2019; however, the critical level is exceeded at River Dever receptors Dever 2, Dever 4 and Dever 5 in 2041.

Table 3: Predicted Baseline Concentrations in 2019 and 2041

Receptor	NOx (µg/m³)		NH_3 (µg/m³)	
	2019	2041	2019	2041
Dever 1	22.5	6.1	1.45	1.50
Dever 2	52.7	11.9	2.60	3.16
Dever 3	48.9	11.2	2.46	2.93
Dever 4	61.2	13.8	2.90	3.65
Dever 5	57.3	13.0	2.75	3.42
Dever 6	45.4	10.7	2.32	2.79
Dever 7	46.9	10.9	2.37	2.86
Dever 8	42.4	10.1	2.22	2.65
Dever 9	40.7	9.7	2.16	2.56
Dever 10	20.7	6.3	1.67	1.84
Dever 11	20.4	6.3	1.67	1.85
Test 1	12.8	5.1	1.34	1.38
Test 2	12.5	5.0	1.33	1.36
Test 3	18.6	6.6	1.47	1.57
Test 4	18.0	6.5	1.45	1.54
Test 5	18.8	6.6	1.48	1.59
Test 6	18.3	6.6	1.46	1.56
Meon 1	24.4	8.6	1.22	1.30
Meon 2	24.1	8.5	1.21	1.28
Meon 3	25.4	8.7	1.27	1.35
Meon 4	25.4	8.7	1.27	1.35
Meon 5	19.6	7.9	1.01	1.05
Meon 6	19.0	7.7	1.00	1.01
Meon 7	16.8	7.4	0.97	0.98
Meon 8	15.7	6.9	1.04	1.09
Meon 9	15.6	6.8	1.04	1.08
Meon 10	15.9	6.9	1.05	1.11
Meon 11	15.8	6.9	1.04	1.10
Meon 12	15.5	6.8	1.03	1.08
Meon 13	13.1	6.0	0.98	0.98
Meon 14	14.0	5.9	1.13	1.18
Meon 15	13.8	5.9	1.12	1.17

Receptor	NO_x (µg/m³)		NH_3 (µg/m³)	
	2019	2041	2019	2041
Meon 16	14.1	5.9	1.14	1.19
Meon 17	14.0	5.9	1.13	1.18
Dun 1	14.9	5.5	1.50	1.58
Dun 2	14.6	5.4	1.49	1.56
Dun 3	15.5	5.6	1.53	1.62
Dun 4	15.4	5.6	1.52	1.62
Critical Level/Load	**30**		**3**	

5 Screening Assessment

5.1. Local Plan Impact In Isolation

5.1.1 This section considers the impact of the Local Plan in isolation. The maximum predicted PCs to annual mean NOx and NH_3 concentrations and the PCs as a percentage of the critical levels at the receptors are shown in **Table 4** and **Table 5** respectively.

5.1.2 The Local Plan in isolation does not lead to any exceedances of the 1% screening threshold for NOx or NH_3 at the receptors closest to the road sources.

5.1.3 The Local Plan results in an increase in AADT on most road links within 200m of the receptors, but a decrease on the M3 and the A34 where they pass over the River Dever, as shown in **Table A2**. There is a small increase in AADT on the A33 and A30 where they pass over the River Dever. The net result of the increases and decreases in AADT on the roads affecting the River Dever at these locations is an improvement in air quality at some receptors (Dever 1 to Dever 5). The Local Plan in isolation results in lower concentrations/deposition rates when compared with baseline concentrations/deposition rates at these receptors; therefore, there is a marginal improvement in air quality at these River Dever receptors. Therefore, any in-combination effect at receptors Dever 1 to Dever 5 would be due to in-combination sources only, and an in-combination assessment is not required for these receptors.

Table 4: NOx PCs and PCs as % of Critical Level – In Isolation

Receptor	Predicted Road Contribution 2041 (µgNOx/m³)			Critical Level (µgNOx/m³)	PC as % of Critical Level	In-combination Assessment Required
	Baseline	Do Minimum	PC			
Dever 1	1.007	1.000	-0.007	30	0.0	No
Dever 2	6.933	6.899	-0.034	30	-0.1	No
Dever 3	6.148	6.118	-0.030	30	-0.1	No
Dever 4	8.821	8.788	-0.033	30	-0.1	No
Dever 5	7.990	7.966	-0.024	30	-0.1	No
Dever 6	5.637	5.658	0.020	30	0.1	Yes
Dever 7	5.925	5.938	0.013	30	0.0	Yes
Dever 8	5.062	5.096	0.034	30	0.1	Yes
Dever 9	4.717	4.751	0.035	30	0.1	Yes
Dever 10	1.349	1.403	0.054	30	0.2	Yes
Dever 11	1.315	1.374	0.058	30	0.2	Yes
Test 1	0.337	0.342	0.005	30	0.0	Yes
Test 2	0.283	0.288	0.005	30	0.0	Yes
Test 3	1.002	1.045	0.043	30	0.1	Yes

Receptor	Predicted Road Contribution 2041 (µgNOx/m^3)			Critical Level (µgNOx/m^3)	PC as % of Critical Level	In-combination Assessment Required
	Baseline	Do Minimum	PC			
Test 4	0.906	0.944	0.039	30	0.1	Yes
Test 5	1.047	1.092	0.045	30	0.1	Yes
Test 6	0.968	1.010	0.041	30	0.1	Yes
Meon 1	1.112	1.135	0.023	30	0.1	Yes
Meon 2	1.070	1.091	0.022	30	0.1	Yes
Meon 3	1.259	1.284	0.025	30	0.1	Yes
Meon 4	1.263	1.289	0.026	30	0.1	Yes
Meon 5	0.425	0.433	0.008	30	0.0	Yes
Meon 6	0.264	0.274	0.010	30	0.0	Yes
Meon 7	0.210	0.219	0.010	30	0.0	Yes
Meon 8	0.372	0.394	0.022	30	0.1	Yes
Meon 9	0.337	0.357	0.020	30	0.1	Yes
Meon 10	0.406	0.430	0.024	30	0.1	Yes
Meon 11	0.374	0.396	0.022	30	0.1	Yes
Meon 12	0.325	0.344	0.019	30	0.1	Yes
Meon 13	0.069	0.073	0.004	30	0.0	Yes
Meon 14	0.357	0.377	0.020	30	0.1	Yes
Meon 15	0.333	0.352	0.018	30	0.1	Yes
Meon 16	0.392	0.414	0.022	30	0.1	Yes
Meon 17	0.374	0.394	0.021	30	0.1	Yes
Dun 1	0.740	0.775	0.035	30	0.1	Yes
Dun 2	0.668	0.700	0.032	30	0.1	Yes
Dun 3	0.854	0.895	0.041	30	0.1	Yes
Dun 4	0.831	0.871	0.040	30	0.1	Yes

Table 5: NH_3 PCs and PCs as % of Critical Level – In Isolation

Receptor	Predicted Road Contribution 2041 ($\mu gNH_3/m^3$)			Critical Level ($\mu gNH_3/m^3$)	PC as % of Critical Level	In-combination Assessment Required
	Baseline	Do Minimum	PC			
Dever 1	0.182	0.181	-0.001	3	0.0	No
Dever 2	1.696	1.685	-0.011	3	-0.4	No
Dever 3	1.475	1.466	-0.009	3	-0.3	No
Dever 4	2.194	2.184	-0.009	3	-0.3	No
Dever 5	1.957	1.951	-0.006	3	-0.2	No
Dever 6	1.333	1.345	0.012	3	0.4	Yes
Dever 7	1.404	1.413	0.009	3	0.3	Yes
Test 11	1.194	1.211	0.017	3	0.6	Yes
Test 12	1.103	1.120	0.017	3	0.6	Yes
Test 13	0.348	0.370	0.022	3	0.7	Yes
Test 14	0.358	0.382	0.023	3	0.8	Yes
Test 15	0.098	0.099	0.001	3	0.0	Yes
Test 16	0.076	0.077	0.001	3	0.0	Yes
Meon 1	0.344	0.358	0.015	3	0.5	Yes
Meon 2	0.307	0.320	0.013	3	0.4	Yes
Meon 3	0.360	0.375	0.015	3	0.5	Yes
Meon 4	0.329	0.343	0.014	3	0.5	Yes
Meon 5	0.358	0.366	0.007	3	0.2	Yes
Meon 6	0.342	0.349	0.007	3	0.2	Yes
Meon 7	0.414	0.422	0.008	3	0.3	Yes
Meon 8	0.414	0.422	0.008	3	0.3	Yes
Meon 9	0.108	0.110	0.002	3	0.1	Yes
Meon 10	0.071	0.074	0.003	3	0.1	Yes
Meon 11	0.060	0.063	0.003	3	0.1	Yes
Meon 12	0.125	0.132	0.007	3	0.2	Yes
Meon 13	0.111	0.118	0.006	3	0.2	Yes
Meon 14	0.137	0.145	0.008	3	0.3	Yes
Meon 15	0.125	0.132	0.007	3	0.2	Yes
Meon 16	0.107	0.113	0.006	3	0.2	Yes
Meon 17	0.015	0.016	0.001	3	0.0	Yes
Meon 18	0.119	0.126	0.007	3	0.2	Yes

Receptor	Predicted Road Contribution 2041 ($\mu gNH_3/m^3$)			Critical Level ($\mu gNH_3/m^3$)	PC as % of Critical Level	In-combination Assessment Required
	Baseline	Do Minimum	PC			
Meon 19	0.110	0.117	0.006	3	0.2	Yes
Meon 20	0.132	0.139	0.008	3	0.3	Yes
Meon 21	0.123	0.130	0.007	3	0.2	Yes
Meon 22	0.235	0.244	0.009	3	0.3	Yes
Meon 23	0.210	0.219	0.008	3	0.3	Yes
Meon 24	0.273	0.284	0.011	3	0.4	Yes
Meon 25	0.265	0.276	0.010	3	0.3	Yes
Meon 26	0.182	0.181	-0.001	3	0.0	Yes

5.2. Local Plan Impact In Combination

5.2.1 This section considers the impact of the Local Plan in-combination with other plans and projects. As explained at **Paragraph 3.3.4**, the Local Plan in isolation PEC (Local Plan PC plus background), minus the 2041 no growth baseline PEC (no growth PC plus background), determines the in-combination pollutant process contribution (PC).

5.2.2 The maximum predicted in-combination PCs to annual mean NOx and NH_3 concentrations and the PCs as a percentage of the critical levels at the receptors are shown in **Table 6** and **Table 7** respectively.

5.2.3 With no growth assumed between the 2019 baseline and the 2041 assessment year, the 2041 baseline concentration/deposition rates are lower; therefore, the in-combination impact is greater than the impact of the Local Plan in isolation.

5.2.4 With regards to NOx, the in-combination PCs exceed the 1% screening threshold at some receptors and an appropriate assessment will need to be completed; however, the with Local Plan PEC is well below the critical level.

5.2.5 With regards ammonia, the in-combination PCs exceed the 1% screening threshold at some receptors and an appropriate assessment will need to be completed; however, the with Local Plan PEC is below the critical level.

5.2.6 NE guidance is clear that insignificant effects of a plan should not be unnecessarily combined with the effects of other plans or projects that could be considered significant in their own right (see **Paragraph 3.4.13**). Therefore, further consideration has been given to impact due to in-combination sources in isolation in **Table 8** and **Table 9**.

5.2.7 With regards NOx, the following receptors have been identified where the in-combination impact is above the 1% screening threshold, and the impact from the in-combination sources on their own is below the 1% screening threshold:

- Test 3, Test 5 and Test 6; and

- Dun 3 and Dun 4.

5.2.8 The maximum NOx PC at these receptors is 0.5% of the NOx critical level, and the critical level is achieved by a very wide margin. The maximum PEC at these receptors with the Local Plan is 6.7µg/m^3, well below the 30µg/m^3 critical level.

5.2.9 With regards NH_3, no receptors have been identified where the in-combination impact is above the 1% screening threshold, and the impact from the in-combination sources on their own is below the 1% screening threshold.

Table 6: NOx PECs, PCs and PCs as % of Critical Level – In-combination

Receptor	Predicted PECs and In-combination PCs 2041 (µgNOx/m^3)			Critical Level (µgNOx/m^3)	PC as % of Critical Level	PEC as % of Critical Level	Appropriate Assessment Required
	No Growth Baseline PEC	With Local Plan PEC	PC				
Dever 6	8.549	10.674	2.124	30	7.1	36	Yes
Dever 7	8.749	10.954	2.205	30	7.3	37	Yes
Dever 8	8.151	10.112	1.962	30	6.5	34	Yes
Dever 9	7.929	9.767	1.838	30	6.1	33	Yes
Dever 10	5.684	6.351	0.667	30	2.2	21	Yes
Dever 11	5.655	6.321	0.666	30	2.2	21	Yes
Test 1	4.937	5.060	0.123	30	0.4	17	No
Test 2	4.902	5.006	0.104	30	0.3	17	No
Test 3	6.302	6.635	0.333	30	1.1	22	Yes
Test 4	6.233	6.534	0.302	30	1.0	22	No
Test 5	6.334	6.682	0.348	30	1.2	22	Yes
Test 6	6.278	6.600	0.322	30	1.1	22	Yes
Meon 1	8.393	8.602	0.209	30	0.7	29	No
Meon 2	8.358	8.559	0.201	30	0.7	29	No
Meon 3	8.516	8.752	0.236	30	0.8	29	No
Meon 4	8.519	8.756	0.237	30	0.8	29	No
Meon 5	7.740	7.900	0.160	30	0.5	26	No
Meon 6	7.674	7.741	0.067	30	0.2	26	No
Meon 7	7.342	7.382	0.040	30	0.1	25	No
Meon 8	6.714	6.897	0.183	30	0.6	23	No
Meon 9	6.694	6.860	0.166	30	0.6	23	No
Meon 10	6.734	6.934	0.200	30	0.7	23	No
Meon 11	6.715	6.899	0.184	30	0.6	23	No

Receptor	Predicted PECs and In-combination PCs 2041 (µgNOx/m³)			Critical Level (µgNOx/m³)	PC as % of Critical Level	PEC as % of Critical Level	Appropriate Assessment Required
	No Growth Baseline PEC	With Local Plan PEC	PC				
Meon 12	6.687	6.847	0.160	30	0.5	23	No
Meon 13	5.935	5.966	0.032	30	0.1	20	No
Meon 14	5.741	5.904	0.164	30	0.5	20	No
Meon 15	5.726	5.879	0.153	30	0.5	20	No
Meon 16	5.762	5.942	0.180	30	0.6	20	No
Meon 17	5.751	5.922	0.171	30	0.6	20	No
Dun 1	5.224	5.511	0.287	30	1.0	18	No
Dun 2	5.176	5.435	0.260	30	0.9	18	No
Dun 3	5.300	5.631	0.331	30	1.1	19	Yes
Dun 4	5.284	5.606	0.323	30	1.1	19	Yes

Table 7: NH_3 PECs, PCs and PCs as % of Critical Level – In-combination

Receptor	Predicted PECs and In-combination PCs 2041 (µgNH₃/m³)			Critical Level (µgNH₃/m³)	PC as % of Critical Level	PEC as % of Critical Level	Appropriate Assessment Required
	No Growth Baseline PEC	With Local Plan PEC	PC				
Dever 6	2.333	2.805	0.472	3	15.7	77.8	Yes
Dever 7	2.389	2.873	0.484	3	16.1	79.6	Yes
Dever 8	2.224	2.671	0.447	3	14.9	74.1	Yes
Dever 9	2.163	2.580	0.418	3	13.9	72.1	Yes
Dever 10	1.672	1.860	0.188	3	6.3	55.7	Yes
Dever 11	1.675	1.872	0.197	3	6.6	55.8	Yes
Test 1	1.344	1.379	0.035	3	1.2	44.8	Yes
Test 2	1.329	1.357	0.027	3	0.9	44.3	No
Test 3	1.476	1.588	0.112	3	3.7	49.2	Yes
Test 4	1.450	1.550	0.100	3	3.3	48.3	Yes
Test 5	1.488	1.605	0.117	3	3.9	49.6	Yes
Test 6	1.466	1.573	0.107	3	3.6	48.9	Yes
Meon 1	1.229	1.306	0.077	3	2.6	41.0	No

Receptor	Predicted PECs and In-combination PCs 2041 ($\mu gNH_3/m^3$)			Critical Level ($\mu gNH_3/m^3$)	PC as % of Critical Level	PEC as % of Critical Level	Appropriate Assessment Required
	No Growth Baseline PEC	With Local Plan PEC	PC				
Meon 2	1.216	1.289	0.073	3	2.4	40.5	No
Meon 3	1.273	1.362	0.089	3	3.0	42.4	No
Meon 4	1.274	1.362	0.089	3	3.0	42.5	Yes
Meon 5	1.008	1.050	0.042	3	1.4	33.6	Yes
Meon 6	0.998	1.014	0.016	3	0.5	33.3	No
Meon 7	0.973	0.983	0.010	3	0.3	32.4	No
Meon 8	1.043	1.102	0.059	3	2.0	34.8	Yes
Meon 9	1.035	1.088	0.053	3	1.8	34.5	Yes
Meon 10	1.050	1.115	0.065	3	2.2	35.0	Yes
Meon 11	1.043	1.102	0.059	3	2.0	34.8	Yes
Meon 12	1.032	1.083	0.051	3	1.7	34.4	Yes
Meon 13	0.929	0.936	0.007	3	0.2	31.0	No
Meon 14	1.129	1.186	0.057	3	1.9	37.6	Yes
Meon 15	1.124	1.177	0.052	3	1.7	37.5	Yes
Meon 16	1.137	1.199	0.062	3	2.1	37.9	Yes
Meon 17	1.132	1.190	0.059	3	2.0	37.7	Yes
Dun 1	1.508	1.594	0.086	3	2.9	50.3	Yes
Dun 2	1.492	1.569	0.077	3	2.6	49.7	Yes
Dun 3	1.534	1.634	0.100	3	3.3	51.1	Yes
Dun 4	1.529	1.626	0.097	3	3.2	51.0	Yes

Table 8: NOx PCs and PCs as % of Critical Level – Contribution from In-combination Sources

Receptor	Predicted PCs 2041 ($\mu gNOx/m^3$)		Critical Level ($\mu gNOx/m^3$)	PC as % of Critical Level		In-combination Sources Only Significant
	In-combination With Local Plan	In-combination Sources Only		In-combination With Local Plan	In-combination Sources Only	
Dever 6	2.124	2.104	30	7.1	7.0	Yes
Dever 7	2.205	2.192	30	7.3	7.3	Yes
Dever 8	1.962	1.928	30	6.5	6.4	Yes
Dever 9	1.838	1.804	30	6.1	6.0	Yes
Dever 10	0.667	0.613	30	2.2	2.0	Yes
Dever 11	0.666	0.608	30	2.2	2.0	Yes
Test 1	0.123	0.117	30	0.4	0.4	No
Test 2	0.104	0.099	30	0.3	0.3	No
Test 3	0.333	0.291	30	1.1	1.0	No
Test 4	0.302	0.263	30	1.0	0.9	No
Test 5	0.348	0.303	30	1.2	1.0	No
Test 6	0.322	0.281	30	1.1	0.9	No
Meon 1	0.209	0.187	30	0.7	0.6	No
Meon 2	0.201	0.179	30	0.7	0.6	No
Meon 3	0.236	0.210	30	0.8	0.7	No
Meon 4	0.237	0.211	30	0.8	0.7	No
Meon 5	0.160	0.152	30	0.5	0.5	No
Meon 6	0.067	0.057	30	0.2	0.2	No
Meon 7	0.040	0.030	30	0.1	0.1	No
Meon 8	0.183	0.161	30	0.6	0.5	No
Meon 9	0.166	0.146	30	0.6	0.5	No
Meon 10	0.200	0.176	30	0.7	0.6	No
Meon 11	0.184	0.162	30	0.6	0.5	No
Meon 12	0.160	0.141	30	0.5	0.5	No
Meon 13	0.032	0.028	30	0.1	0.1	No
Meon 14	0.164	0.144	30	0.5	0.5	No
Meon 15	0.153	0.135	30	0.5	0.4	No
Meon 16	0.180	0.158	30	0.6	0.5	No
Meon 17	0.171	0.151	30	0.6	0.5	No

Receptor	Predicted PCs 2041 (µgNOx/m^3)		Critical Level (µgNOx/m^3)	PC as % of Critical Level		In-combination Sources Only Significant
	In-combination With Local Plan	In-combination Sources Only		In-combination With Local Plan	In-combination Sources Only	
Dun 1	0.287	0.252	30	1.0	0.8	No
Dun 2	0.260	0.228	30	0.9	0.8	No
Dun 3	0.331	0.290	30	1.1	1.0	No
Dun 4	0.323	0.283	30	1.1	0.9	No

Table 9: NH_3 PCs and PCs as % of Critical Level – Contribution from In-combination Sources

Receptor	Predicted PCs 2041 (µgNH$_3$/m^3)		Critical Level (µgNH$_3$/m^3)	PC as % of Critical Level		In-combination Sources Only Significant
	In-combination With Local Plan	In-combination Sources Only		In-combination With Local Plan	In-combination Sources Only	
Dever 6	0.472	0.460	3	15.7	15.3	Yes
Dever 7	0.484	0.475	3	16.1	15.8	Yes
Dever 8	0.447	0.429	3	14.9	14.3	Yes
Dever 9	0.418	0.400	3	13.9	13.3	Yes
Dever 10	0.188	0.166	3	6.3	5.5	Yes
Dever 11	0.197	0.174	3	6.6	5.8	Yes
Test 1	0.035	0.034	3	1.2	1.1	Yes
Test 2	0.027	0.026	3	0.9	0.9	No
Test 3	0.112	0.097	3	3.7	3.2	Yes
Test 4	0.100	0.087	3	3.3	2.9	Yes
Test 5	0.117	0.102	3	3.9	3.4	Yes
Test 6	0.107	0.093	3	3.6	3.1	Yes
Meon 1	0.077	0.070	3	2.6	2.3	Yes
Meon 2	0.073	0.066	3	2.4	2.2	Yes
Meon 3	0.089	0.080	3	3.0	2.7	Yes
Meon 4	0.089	0.080	3	3.0	2.7	Yes
Meon 5	0.042	0.040	3	1.4	1.3	Yes
Meon 6	0.016	0.013	3	0.5	0.4	No
Meon 7	0.010	0.007	3	0.3	0.2	No

Receptor	Predicted PCs 2041 ($\mu gNH_3/m^3$)		Critical Level ($\mu gNH_3/m^3$)	PC as % of Critical Level		In-combination Sources Only Significant
	In-combination With Local Plan	In-combination Sources Only		In-combination With Local Plan	In-combination Sources Only	
Meon 8	0.059	0.052	3	2.0	1.7	Yes
Meon 9	0.053	0.046	3	1.8	1.5	Yes
Meon 10	0.065	0.057	3	2.2	1.9	Yes
Meon 11	0.059	0.052	3	2.0	1.7	Yes
Meon 12	0.051	0.045	3	1.7	1.5	Yes
Meon 13	0.007	0.006	3	0.2	0.2	No
Meon 14	0.057	0.050	3	1.9	1.7	Yes
Meon 15	0.052	0.046	3	1.7	1.5	Yes
Meon 16	0.062	0.055	3	2.1	1.8	Yes
Meon 17	0.059	0.052	3	2.0	1.7	Yes
Dun 1	0.086	0.077	3	2.9	2.6	Yes
Dun 2	0.077	0.069	3	2.6	2.3	Yes
Dun 3	0.100	0.089	3	3.3	3.0	Yes
Dun 4	0.097	0.087	3	3.2	2.9	Yes

5.3. NOx Reductions Over Time

5.3.1 As baseline NOx concentrations are above the critical level at some receptor locations in 2019, an analysis has been undertaken to determine that the Local Plan does not hinder progress against the restore conservation objective for the River Itchen SAC.

5.3.2 Traffic data is only available for the 2019 baseline year and the 2041 assessment year; therefore, traffic flows for each year have been estimated at roads affecting receptor Dever 7 assuming a linear change between the 2019 and 2041 data. Dever 7 is the receptor location where baseline PEC annual mean NOx concentrations for unscreened receptors are highest (see **Table 3**).

5.3.3 The traffic data has then been used to calculate road NOx emissions for each year. The NOx emissions for each year have then been used to calculate factors to apply to the predicted annual mean NOx PC in 2019 to estimate the NOx PC in each year. The estimated NOx PCs have then been added to the annual mean background NOx concentrations for each year, from the Defra background maps, to estimate when concentrations fall below the 30$\mu g/m^3$ critical level. Using this approach, it is estimated that the annual mean NOx concentration at receptor Dever 7 falls below the critical level in 2024, when the estimated concentration is 28.4$\mu g/m^3$. The data supporting this analysis are shown in **Table 10**.

5.3.4 The data in **Table 10** show a year-on-year reduction in background NOx concentrations and road NOx emissions, even with increasing volumes of traffic on the A30 and A34. The reductions are driven by improvements in emissions technology and an increasing proportion of low emission and electric vehicles in the UK fleet. Therefore, the Local Plan will not hinder progress against the restore conservation objective for the River Itchen SAC.

Table 10: Data Used for the NOx Reduction Over Time Analysis

Year	AADT		%HDV		Road NOx Emissions (g/km/s)			Factor	Annual Mean NOx (µg/m^3)		
	Road D (A30)	Road E (A34)	Road D (A30)	Road E (A34)	Road D (A30)	Road E (A34)	Total		Bkgd	PC	PEC
2019	7,125	54,698	0.7	8.4	0.032	0.332	0.364	1.000	17.6	29.3	46.9
2020	7,430	56,100	0.8	8.3	0.032	0.326	0.358	0.985	17.6	28.9	46.5
2021	7,734	57,502	0.9	8.1	0.029	0.283	0.311	0.856	10.5	25.1	35.6
2022	8,038	58,904	1.0	8.0	0.027	0.258	0.285	0.784	10.2	23.0	33.2
2023	8,343	60,307	1.1	7.8	0.025	0.235	0.261	0.716	9.9	21.0	30.9
2024	8,647	61,709	1.2	7.7	0.023	0.213	0.236	0.649	9.4	19.0	28.4
2025	8,951	63,111	1.3	7.5	0.022	0.193	0.215	0.590	8.9	17.3	26.2
2026	9,256	64,513	1.4	7.4	0.020	0.173	0.193	0.531	8.5	15.6	24.0
2027	9,560	65,915	1.5	7.2	0.018	0.155	0.173	0.476	8.0	13.9	22.0
2028	9,865	67,317	1.6	7.1	0.016	0.138	0.154	0.423	7.6	12.4	20.0
2029	10,169	68,719	1.7	6.9	0.014	0.122	0.136	0.374	7.2	11.0	18.1
2030	10,473	70,122	1.8	6.8	0.013	0.107	0.120	0.329	6.7	9.7	16.4
2031	10,778	71,524	1.9	6.6	0.011	0.095	0.106	0.291	6.4	8.5	14.9
2032	11,082	72,926	2.0	6.5	0.010	0.084	0.094	0.260	6.1	7.6	13.7
2033	11,387	74,328	2.1	6.3	0.009	0.076	0.085	0.234	5.8	6.9	12.7
2034	11,691	75,730	2.2	6.2	0.009	0.070	0.079	0.216	5.6	6.3	11.9
2035	11,995	77,132	2.3	6.0	0.008	0.066	0.074	0.203	5.5	6.0	11.4
2036	12,300	78,534	2.4	5.9	0.008	0.063	0.071	0.195	5.4	5.7	11.1
2037	12,604	79,936	2.5	5.7	0.008	0.062	0.069	0.191	5.3	5.6	10.9
2038	12,908	81,339	2.6	5.6	0.008	0.061	0.069	0.189	5.2	5.5	10.7
2039	13,213	82,741	2.7	5.4	0.008	0.061	0.069	0.189	5.1	5.5	10.6
2040	13,517	84,143	2.8	5.3	0.008	0.061	0.069	0.190	5.0	5.6	10.6
2041	13,822	85,545	2.9	5.1	0.008	0.062	0.070	0.191	5.0	5.6	10.6

6 Conclusions

6.1.1 The assessment has demonstrated that the Local Plan does not result in any exceedances of the 1% screening threshold for NOx or NH_3 when considered in isolation.

6.1.2 In-combination exceedances of the 1% screening threshold for NOx and NH_3 are predicted and an appropriate assessment will need to be completed. The NOx and NH_3 PECs are below the critical levels at all receptors where the 1% screening threshold is exceeded.

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8 Appendices

A1 Modelling Methodology

A1.1. Receptors

A1.1.1 Receptors have been modelled at indicative receptors closest to roads affected by the Local Plan. Full details of each receptor point are shown in **Table A1** and the locations are shown in Figure 2 to Figure 11.

Table A1: Receptor Locations

Point ID	Description	OS Coordinate		
		x	y	z
Dever 1	East of West Stratton	453385.0	140254.2	0
Dever 2	South of A303/A34/A30 Junction	446195.9	141310.1	0
Dever 3	South of A303/A34/A30 Junction	446190.9	141308.6	0
Dever 4	South of A303/A34/A30 Junction	446235.7	141323.7	0
Dever 5	South of A303/A34/A30 Junction	446240.6	141325.1	0
Dever 6	South of A303/A34/A30 Junction	446265.1	141338.3	0
Dever 7	South of A303/A34/A30 Junction	446260.6	141336.1	0
Dever 8	South of A303/A34/A30 Junction	446275.7	141337.9	0
Dever 9	South of A303/A34/A30 Junction	446281.2	141337.8	0
Dever 10	South of A303/A34/A30 Junction	446439.5	140792.6	0
Dever 11	South of A303/A34/A30 Junction	446461.9	140445.4	0
Test 1	North of Stonymarsh	433902.9	127976.0	0
Test 2	North of Stonymarsh	433824.0	127728.0	0
Test 3	North of Romsey	435152.8	123400.4	0
Test 4	North of Romsey	435147.5	123401.6	0
Test 5	North of Romsey	435161.3	123395.4	0
Test 6	North of Romsey	435164.8	123391.2	0
Meon 1	Wickham	457227.8	111256.6	0
Meon 2	Wickham	457223.6	111253.8	0
Meon 3	Wickham	457235.5	111262.1	0
Meon 4	Wickham	457239.5	111264.7	0
Meon 5	Wickham	457442.5	111469.2	0
Meon 6	Wickham	457648.8	111697.3	0
Meon 7	Wickham	457933.8	112059.5	0
Meon 8	West of Soberton	459661.4	114418.9	0
Meon 9	West of Soberton	459656.4	114419.5	0
Meon 10	West of Soberton	459670.9	114417.9	0

Point ID	Description	OS Coordinate		
		x	y	z
Meon 11	West of Soberton	459676.0	114416.9	0
Meon 12	West of Soberton	459744.2	114653.0	0
Meon 13	Droxford	460877.3	118593.3	0
Meon 14	Corhampton	461027.0	120325.6	0
Meon 15	Corhampton	461025.3	120330.4	0
Meon 16	Corhampton	461032.8	120311.8	0
Meon 17	Corhampton	461037.2	120309.3	0
Dun 1	Dunbridge	431834.3	126251.5	0
Dun 2	Dunbridge	431829.6	126249.5	0
Dun 3	Dunbridge	431842.0	126254.7	0
Dun 4	Dunbridge	431846.9	126255.7	0

Figure 2: Dever 1 Receptor and Modelled Roads

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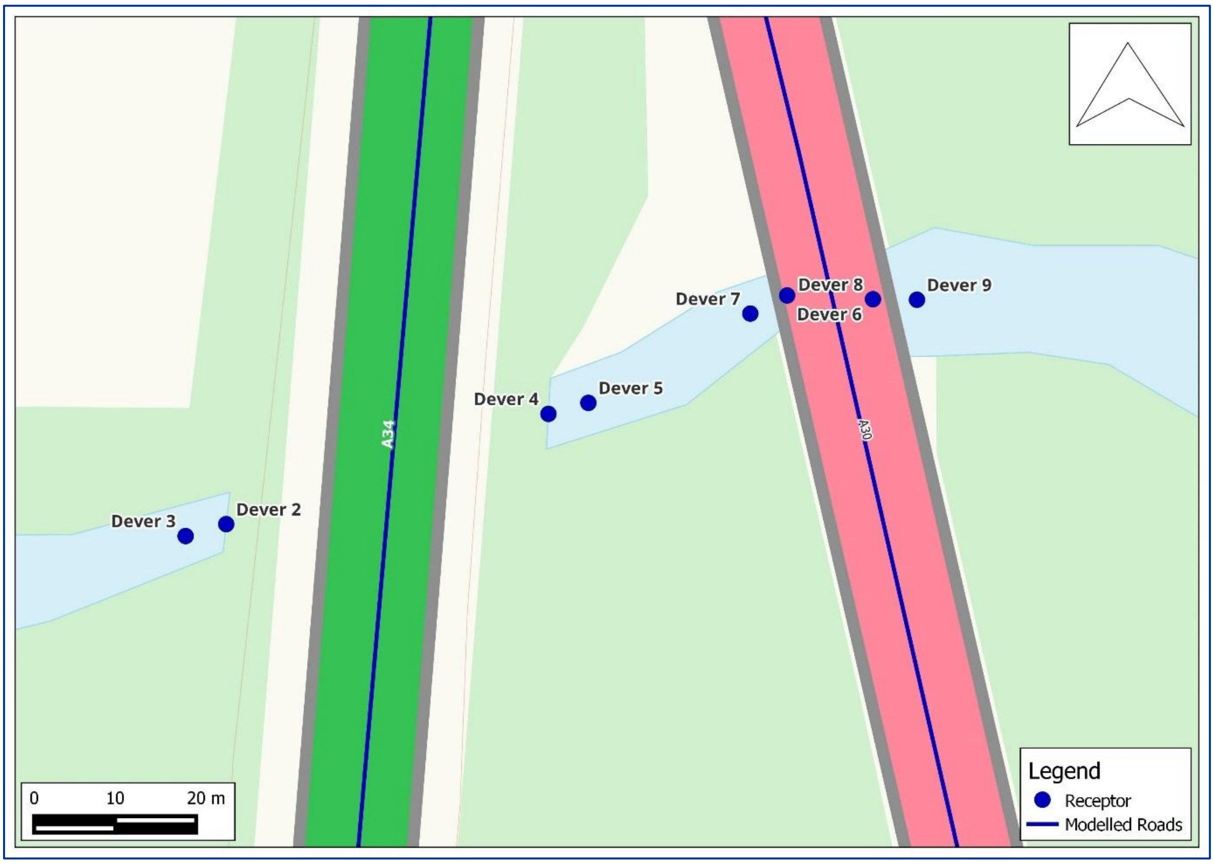

Figure 3: Dever 2 to Dever 9 Receptors and Modelled Roads

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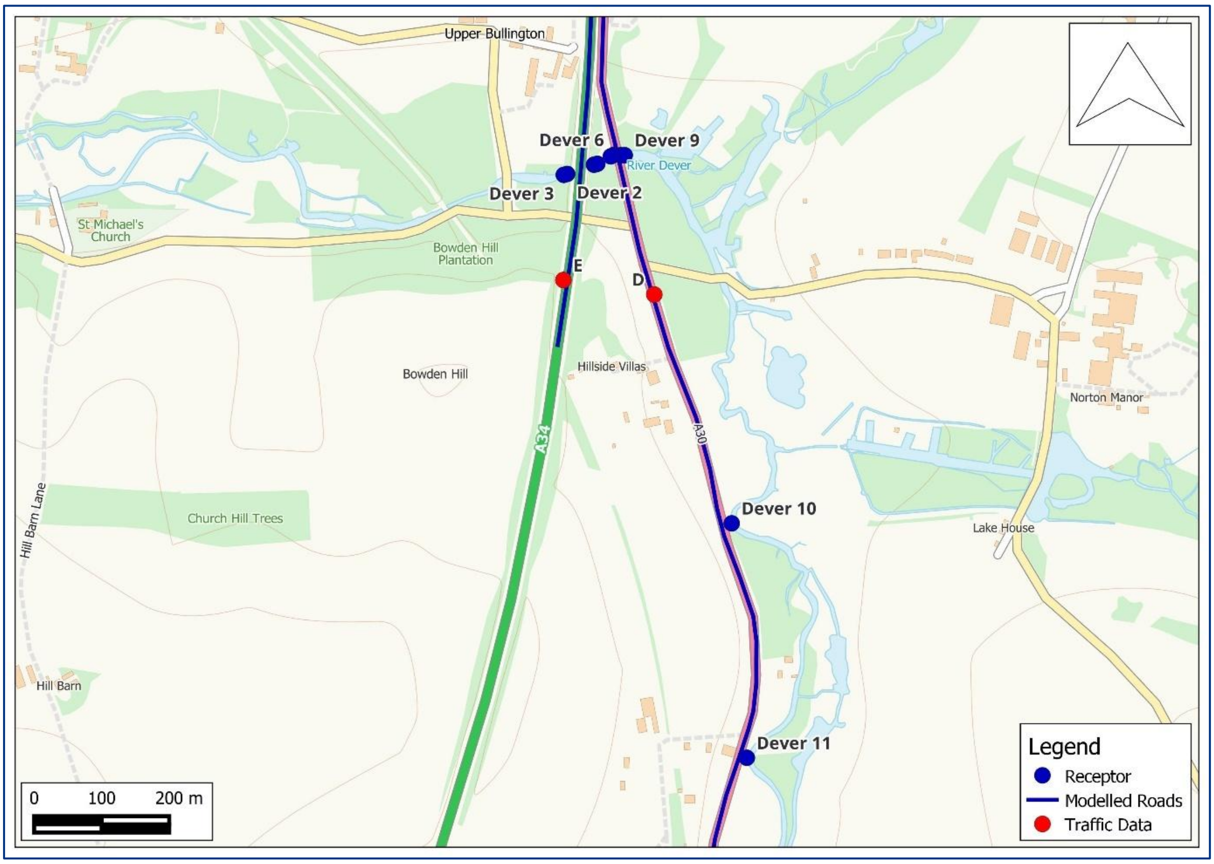

Figure 4: Dever 2 to Dever 11 Receptors and Modelled Roads

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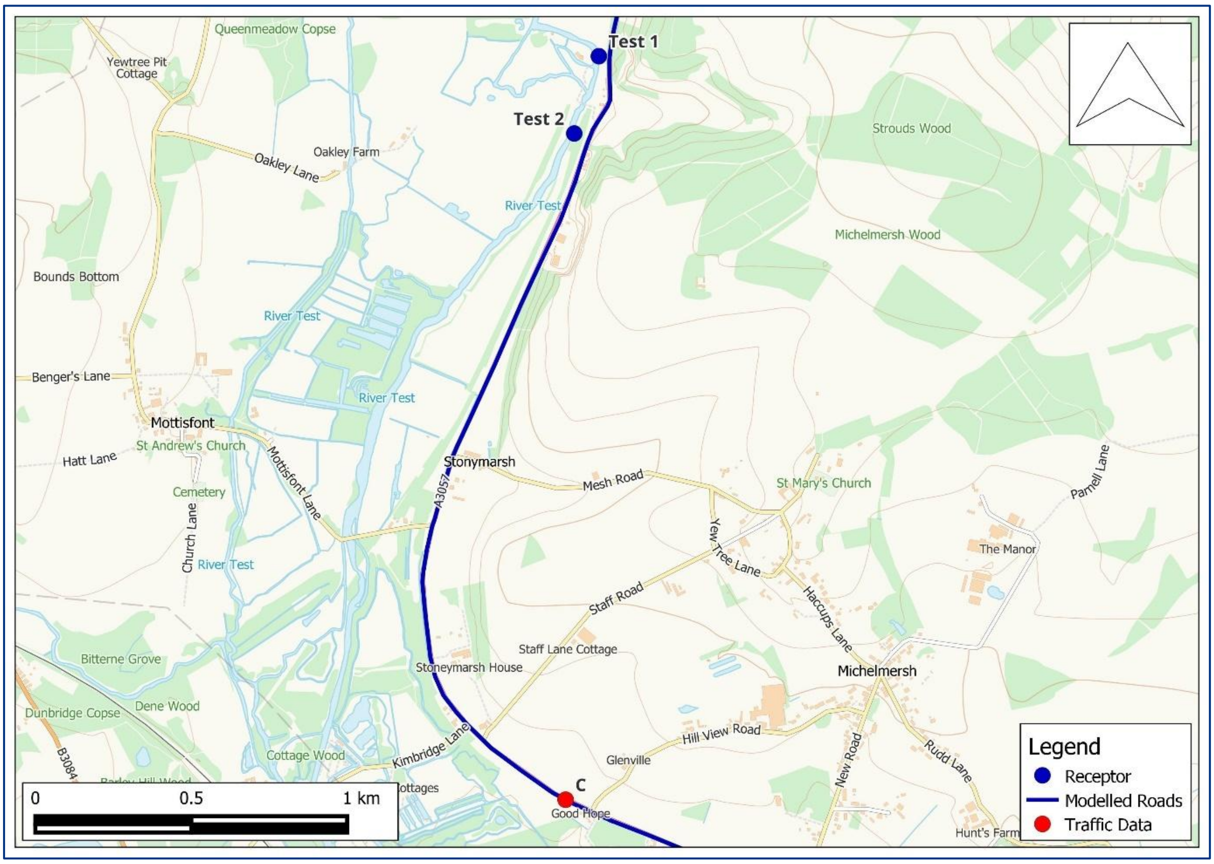

Figure 5: Test 1 and Test 2 Receptors and Modelled Roads

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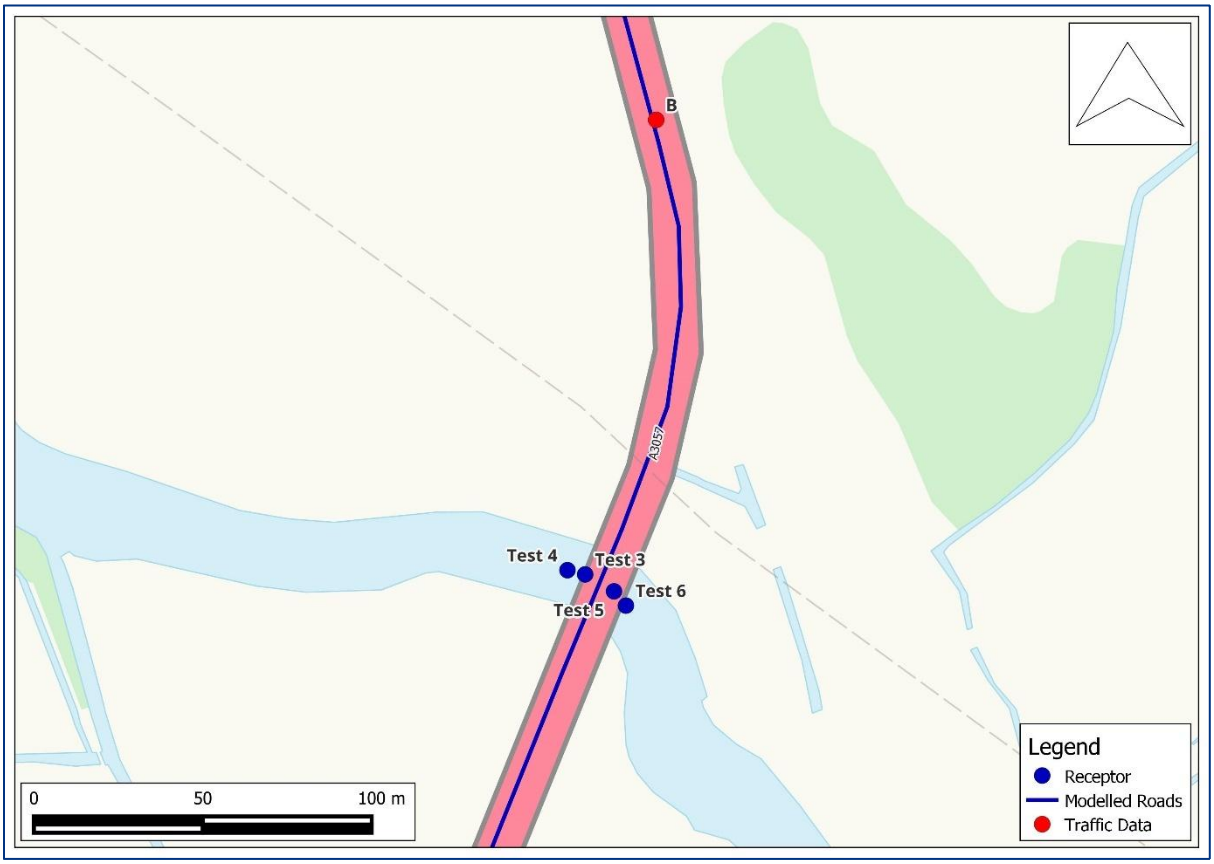

Figure 6: Test 3 to Test 6 Receptors and Modelled Roads

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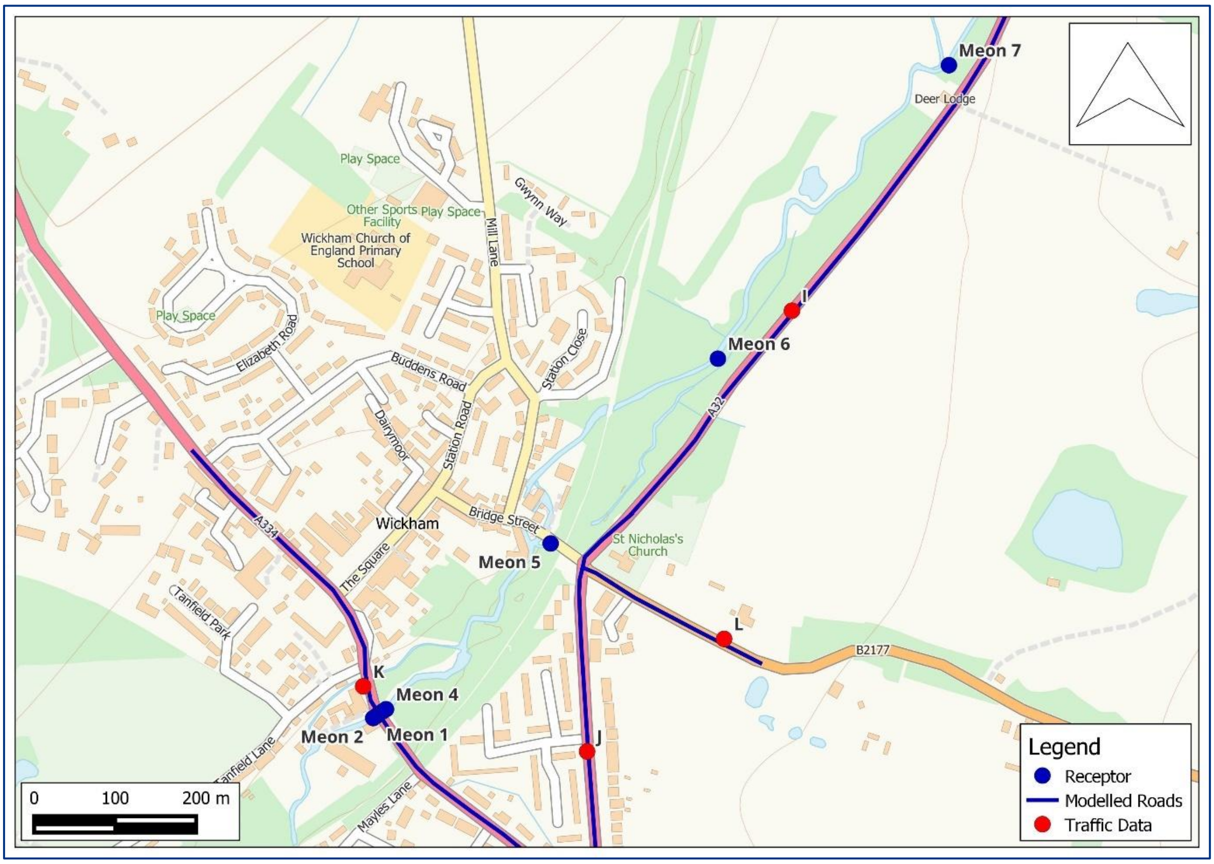

Figure 7: Meon 1 to Meon 7 Receptors and Modelled Roads

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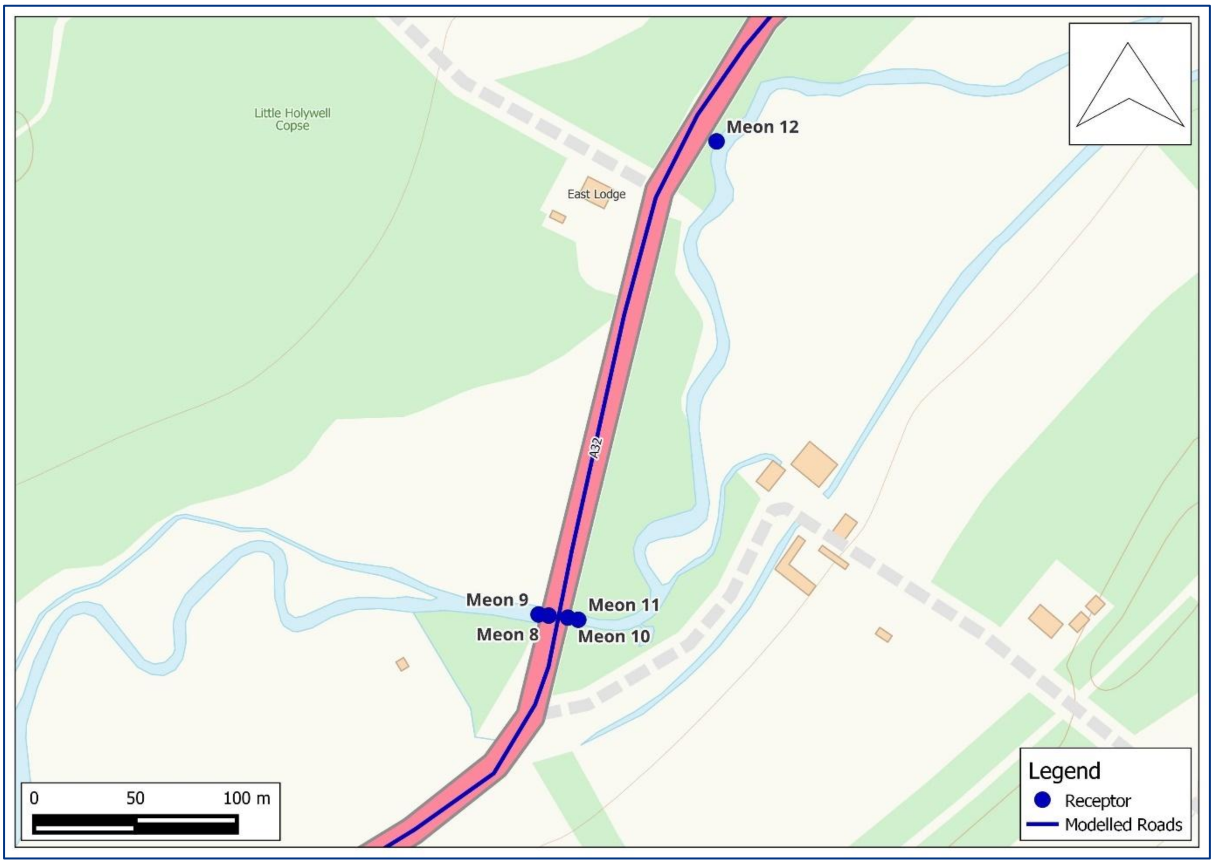

Figure 8: Meon 8 to Meon 12 Receptors and Modelled Roads

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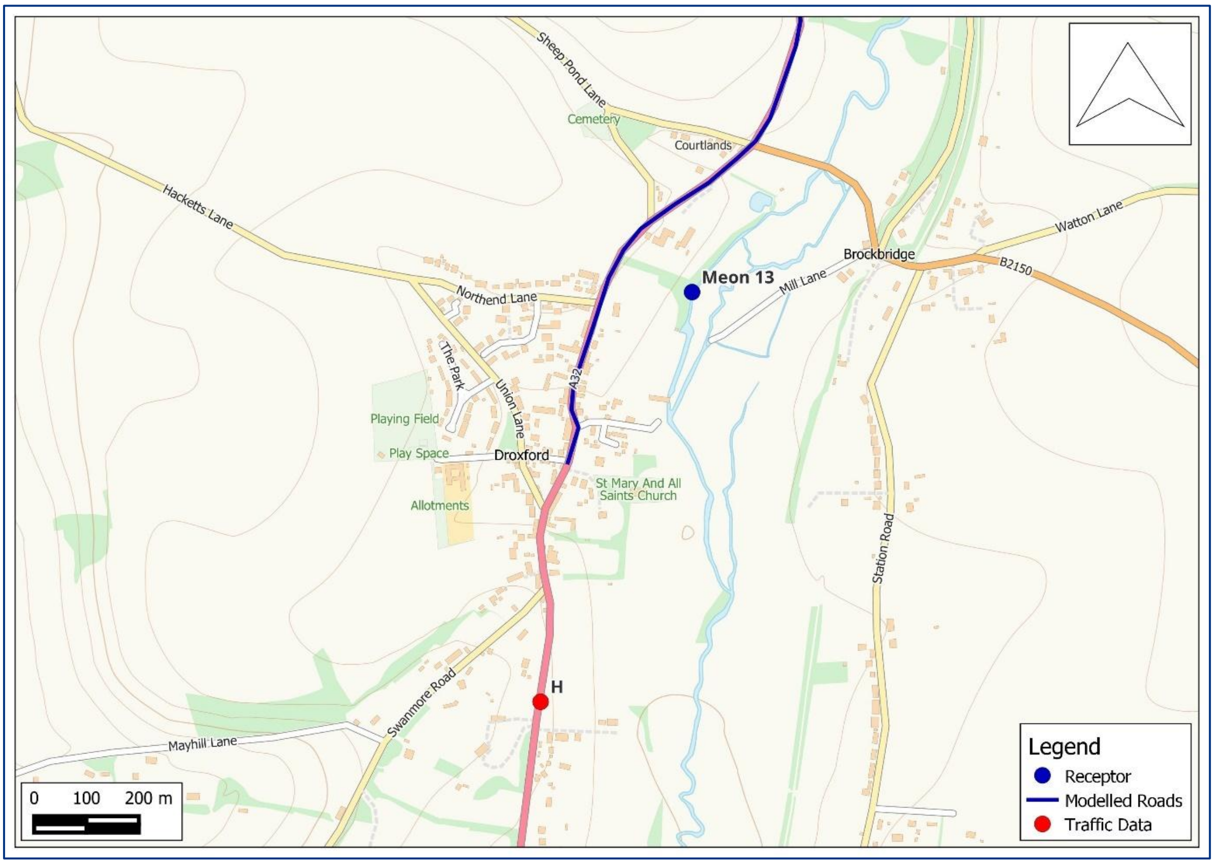

Figure 9: Meon 13 Receptor and Modelled Roads

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Figure 10: Meon 14 to Meon 17 Receptor and Modelled Roads

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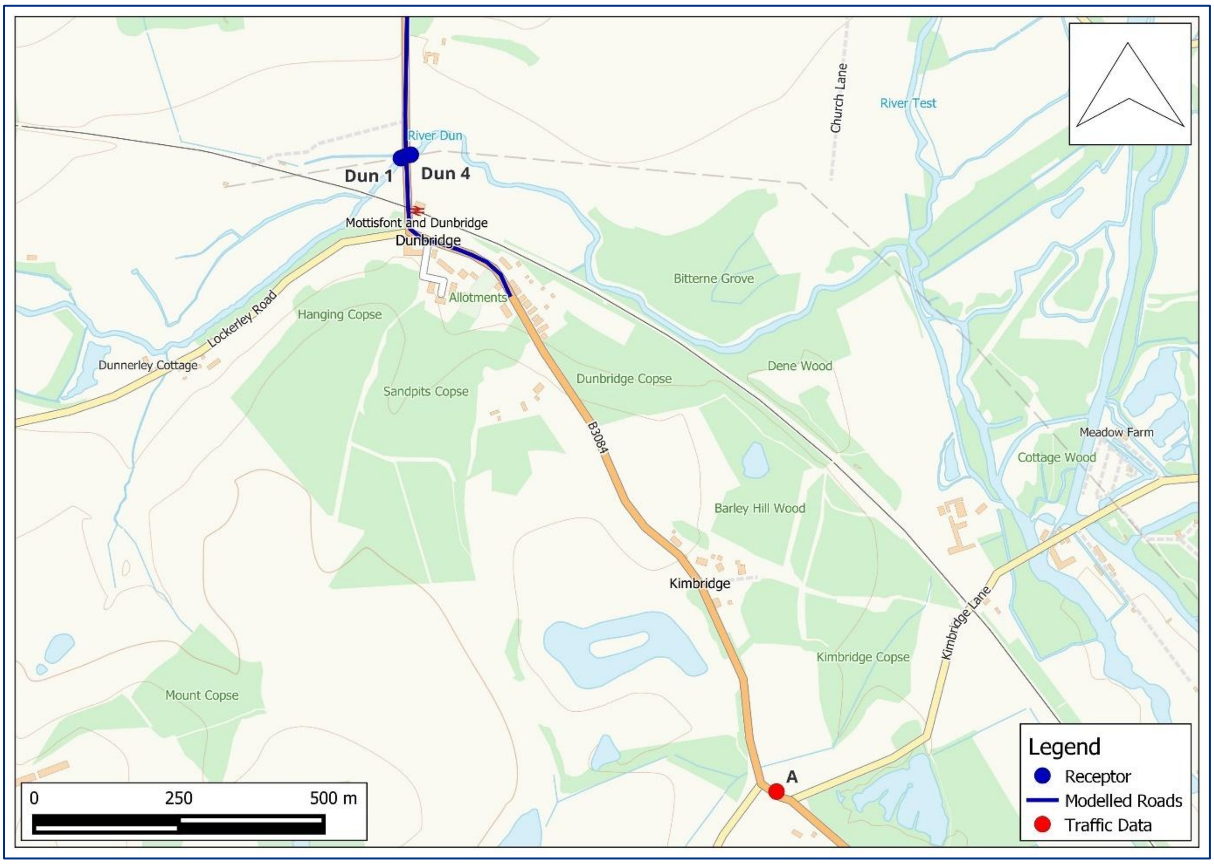

Figure 11: Dun 1 to Dun 4 Receptors and Modelled Roads

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A1.2. Model Inputs

Traffic Data

A1.2.1 The AADT flows and vehicle fleet composition data have been provided by SYSTRA and come from the SRTM. The traffic data are shown in **Table A2** and the modelled road network used for the assessment is shown in **Figure 2** to **Figure 11**. Diurnal flow profiles for the traffic have been derived from the national diurnal profiles published by the DfT (DfT, 2025a). Vehicle speeds have been estimated based on the speed limit for the road, reduced to 20km/h within 25m of a junction stop line.

A1.2.2 Roads have been modelled at a height of 2m to account for bridge height above the rivers.

Table A2: Summary of Traffic Data used in the Assessment

Label on Figure	Road Description	AADT			% HDV		
		2019	2041		2019	2041	
			Baseline	With Local Plan		Baseline	With Local Plan
A	B3084	5,367	7,393	7,433	6.4	9.1	10.3
B	A3057	8,209	12,036	12,559	4.2	2.8	2.8
C	A3057	4,916	7,643	7,846	4.9	4.5	4.1
D	A30	7,125	13,294	13,822	0.7	2.1	2.9
E	A34	54,698	86,131	85,545	8.4	5.2	5.1
F	A33	6,126	12,546	12,900	5.4	4.6	4.6
G	M3	61,530	81,100	79,929	9.5	8.7	8.8
H	A32	2,393	4,393	4,668	4.2	2.3	2.2
I	A32	3,390	3,875	4,079	3.5	2.7	2.5
J	A32	6,319	10,202	10,505	4.9	3.5	3.4
K	A334	10,381	14,264	14,560	7.7	4.2	4.2
L	B2177	4,567	13,747	13,716	4.9	3.5	3.5

Emissions

A1.2.3 NOx emissions have been calculated using the most recent version of the Emissions Factor Toolkit (EFT) v12.1, which provides fleet projections and emission rates through to 2050 (Defra, 2025). The traffic data have been entered into the EFT in order to calculate a combined emission rate for each of the road links in the modelled network. Supporting LAQM tools published by Defra, i.e., the background mapping data and NOx to NO_2 Calculator, only support assessment years up to 2040; therefore, 2041 emissions data from the EFT have been used, along with 2040 data from the LAQM tools.

A1.2.4 There is evidence that excluding NH_3 from road traffic emissions assessments may underestimate impacts on sensitive habitats (Air Quality Consultants Ltd, 2020). Emissions of NH_3 from individual vehicle types are highly uncertain as they are not regulated, which would also mean that the level of nitrogen deposition derived from the ambient NH_3 concentrations would be highly uncertain. There is currently no tool publicly available for the assessment of road traffic emissions of NH_3 from National Highways, Defra, Natural England, or other nature conservation bodies; therefore, NH_3 emissions have been calculated using the Calculator for Road Emissions of Ammonia (CREAM) tool (V1A) published by Air Quality Consultants Ltd (Air Quality Consultants Ltd, 2020). The NH_3 emissions in the tool have been derived from the results of remote sensing, real-world fuel consumption data, and ambient ammonia measurements recorded in Ashdown Forest (2014-2016). There are no results from direct testing of ammonia emissions from vehicles made over representative drive cycles which are considered suitable to generate robust, fleet-wide emissions factors for use in the UK. There is a high level of uncertainty associated with the CREAM NH_3 emissions data; however, Air Quality Consultants Ltd consider that using the emissions factors to make future-year predictions will be an improvement on any assessment that omits ammonia and that the emissions can be considered to provide the most robust estimate of traffic-related ammonia possible at the present time.

A1.2.5 The CREAM tool currently uses vehicle fleet information from Defra's EFT v9 which has now been superseded by EFT v12.1. EFT v9 used base 2018 fleet composition data that assumes that there are no electric vehicles in rural areas in England in 2035, the latest year that CREAM emissions data are available. EFT v12.1 uses base 2022 fleet composition data that assumes that 25% of the vehicle fleet in rural areas and on motorways will be electric in 2041. Air Quality Consultants Ltd is currently working on an update to the CREAM tool that will use the DfT's Transport Analysis Guidance (TAG) to estimate the proportion of electric vehicles on the road in future years (Air Qualtiy Consultants Ltd, 2023). The UK government has announced a ban on new diesel and petrol cars from 2035, with a requirement that 80% of new cars and 70% of new vans be zero emission by 2030, and the TAG assumes that 63% of cars and 31% of LGVs will be electric in 2036 (DfT, 2024b). Therefore, as electric vehicles do not have any on road emissions, the current CREAM tool significantly underestimates the number of electric vehicles on the road in future years and is likely to overestimate ammonia emissions.

A1.2.6 In order to account for the expected fleet composition of electric vehicles in 2041, 25% of the light vehicle flows have been removed from the annual average daily traffic flows input to the CREAM tool. This results in estimated ammonia emissions in 2041 that use CREAM 2035 emissions data and the 2041 EFT v12.1 fleet composition data.

Meteorological Data

A1.2.7 The model has been run using the full year of 2019 meteorological data taken from the monitoring station located at Southampton Airport, approximately 9km to the south of the study area. A wind rose of the data is shown in **Figure 12**.

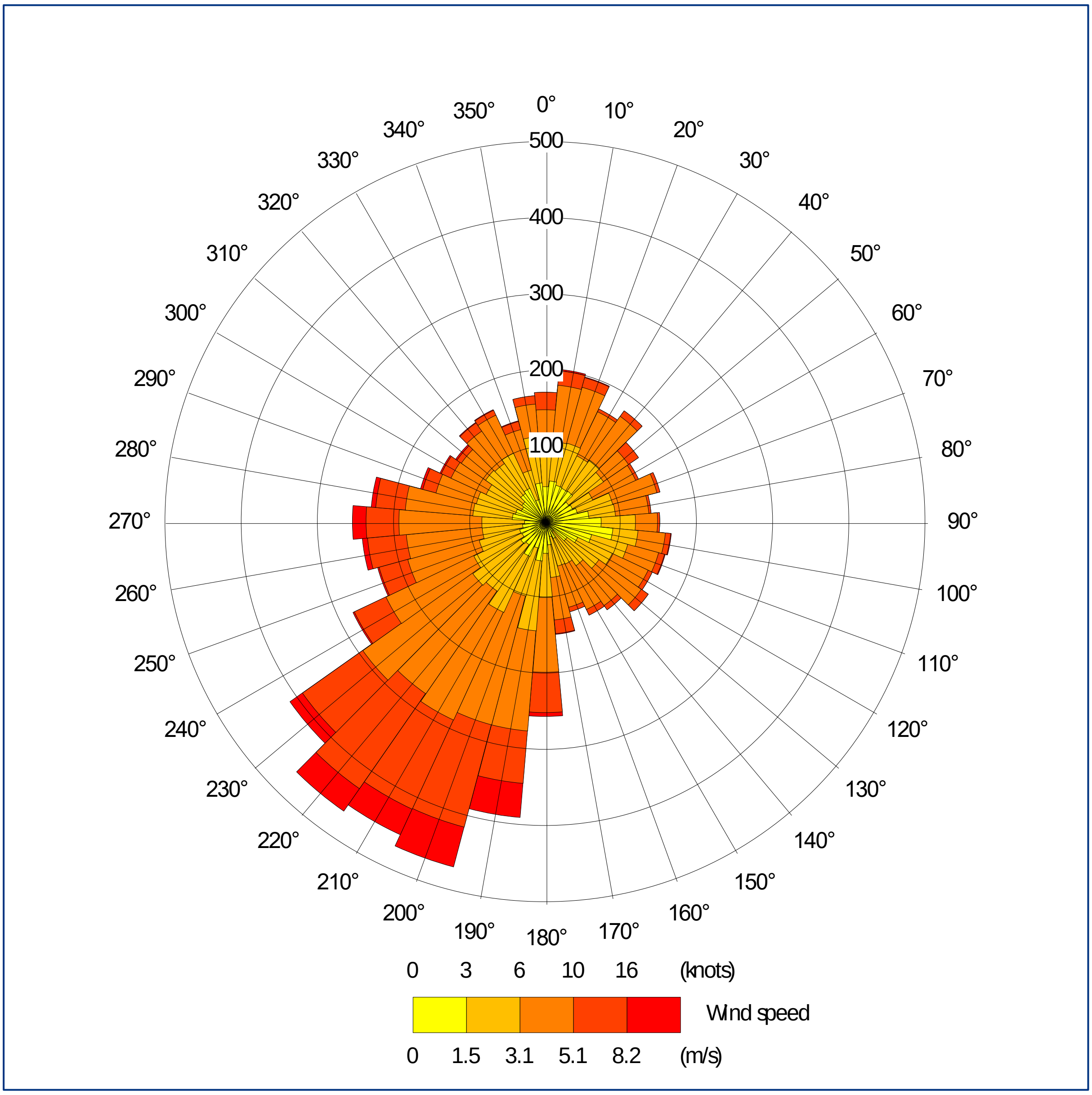

Figure 12: Wind Rose Southampton Airport 2019

A1.3. Background Concentrations

A3.1.1 Background NOx and NO_2 concentrations have been derived from those published by Defra (Defra, 2025). These cover the whole country on a 1 km by 1 km grid and are published for each year from 2021 to 2040. As the background maps are only available up to 2040, it has been assumed that background concentrations in 2041 will be the same as those in in the Defra 2040 map. The projections in the 2018 LAQM background maps have been used to derive 2019 background concentrations.

A3.1.2 Background NH_3 and nitrogen and acid deposition data have been taken from the APIS database (APIS, 2025). Future year background concentrations and deposition fluxes have been assumed to be the same as the 2020-2022 average provided by APIS.

A3.1.3 Future estimates of atmospheric ammonia concentrations are not provided by APIS and the assessment assumes there will be no reduction in background ammonia concentrations. This is a conservative assumption as, under the National Emissions Ceilings Regulations (NECR), the UK must meet legally binding ammonia emissions reductions of 16% compared with the relevant 2005 baseline emission levels by 2030, and this should result in a reduction in background concentrations. A National Air Pollution Control Programme (NAPCP) sets out how the UK can meet the legally binding 2030 emission reduction commitments (ERCs). The Nitrogen Futures project has developed a quantitative spatial dataset of 2030 ammonia emissions based on future projections of source activities for NAPCP scenarios (JNCC, 2024). The results from the Nitrogen Futures 2030 NAPCP+DA (NECR NOx) baseline scenario provide the most likely future baseline for ammonia concentrations (JNCC, 2020). DA refers to modifications due to input from the Devolved Administrations and NECR NOx refers to NOx emissions meeting the 2030 NECR targets. The Nitrogen Futures project compared a current baseline (2017) with 2030 baseline scenario NAPCP+DA (NECR NOx) to evaluate the likely effects of NECR related polices on atmospheric ammonia.

A3.1.4 The Nitrogen Futures project estimates that implementation of the NAPCP would result in a 12% reduction in UK ammonia emissions when compared to the 2017 baseline, with a corresponding decrease in atmospheric ammonia concentrations of between 0.05-0.25µg/m^3 in the study area.

A1.4. Verification

A1.4.1 The verification process seeks to minimise uncertainties associated with the air quality model by comparing the model output with locally measured concentrations. The model has been verified against 2019 data from four nitrogen dioxide (NO_2) diffusion tube monitoring sites located in Winchester. The monitoring sites are shown in **Figure 13**. The data used for model verification is provided in **Table A3**. The verification methodology is described below.

Table A3: Data Used for Model Verification

Monitoring Site ID	Monitoring Site Location	Measured Annual Mean NO_2 Concentration 2019 (µg/m^3)	Annual Mean Background NO_2 Concentration 2019 (µg/m^3)
Site 11	Southgate St	28.3	14.1
Site 16	Alresford Rd (M3)	30.0	17.8
Site 17	Chesil St	35.3	14.6
Site 22	St Cross Rd	20.2	14.1

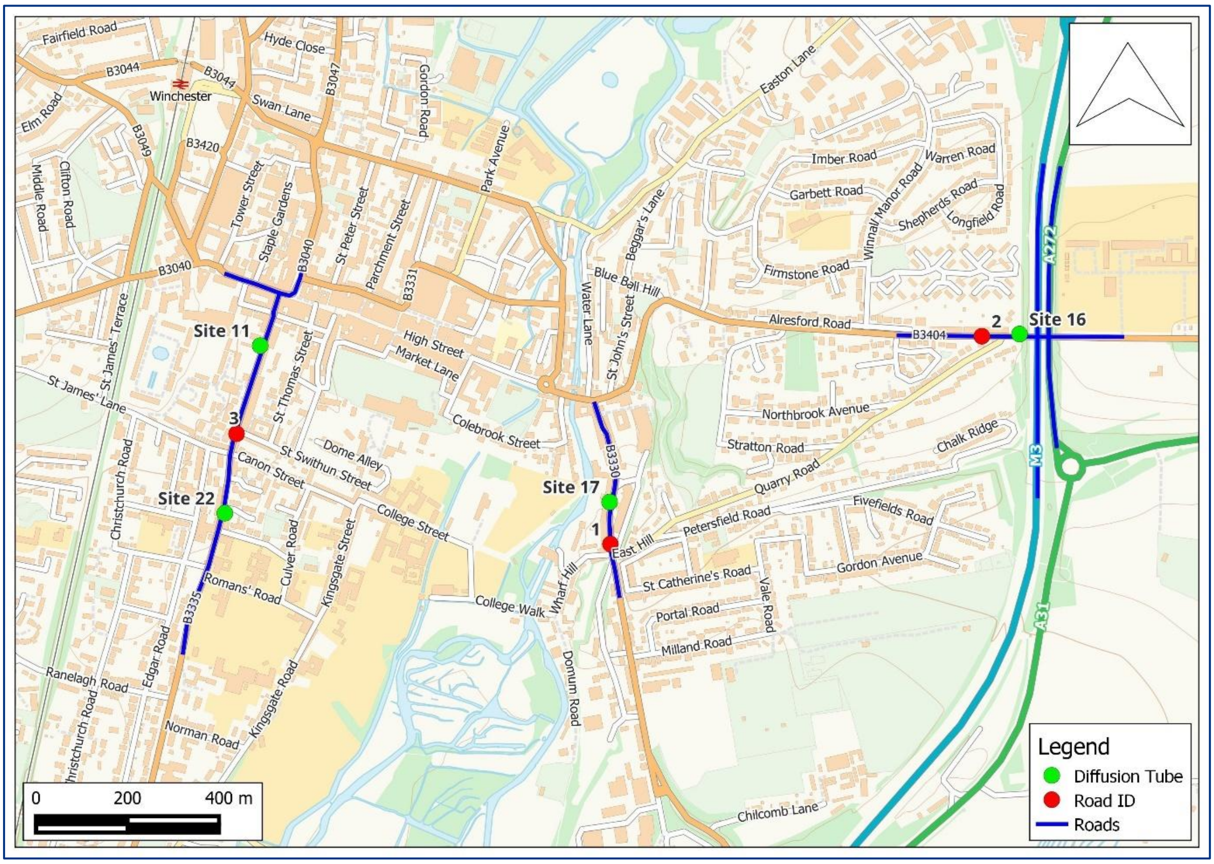

Figure 13: Diffusion Tube Monitoring Sites and Roads Used for Model Verification
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NO_2

A1.4.2 Most NO_2 is produced in the atmosphere by reaction of nitric oxide (NO) with ozone. It is therefore most appropriate to verify the model in terms of primary pollutant emissions of nitrogen oxides ($NOx = NO + NO_2$). The model has been run to predict the 2019 annual mean NOx concentrations at the monitoring sites.

A1.4.3 The model output of road-NOx has been compared with the 'measured' road-NOx, calculated from the measured annual mean NO_2 concentrations and the background concentrations using the NOx from NO_2 calculator v8.1 published by Defra (Defra, 2024).

A1.4.4 The slope of the best-fit line between the 'measured' road-NOx contribution and the model derived road-NOx contribution, forced through zero, has been used to determine the adjustment factor (**Figure 14**). The adjustment factor of 1.22 has been applied to the modelled road-NOx concentration for each receptor to provide adjusted modelled road-NOx concentrations. The NOx to NO_2 calculator has then been used to determine total NO_2 concentrations from the adjusted modelled road-NOx concentrations and the background NO_2 concentrations.

A1.4.5 A comparison of the final adjusted modelled total NO_2 at each monitoring site to the measured total NO_2 shows close agreement (**Figure 15**). The results imply that the model has over-predicted the road-NOx contribution. An evaluation of the model performance using statistical methods is shown in **Table A4**.

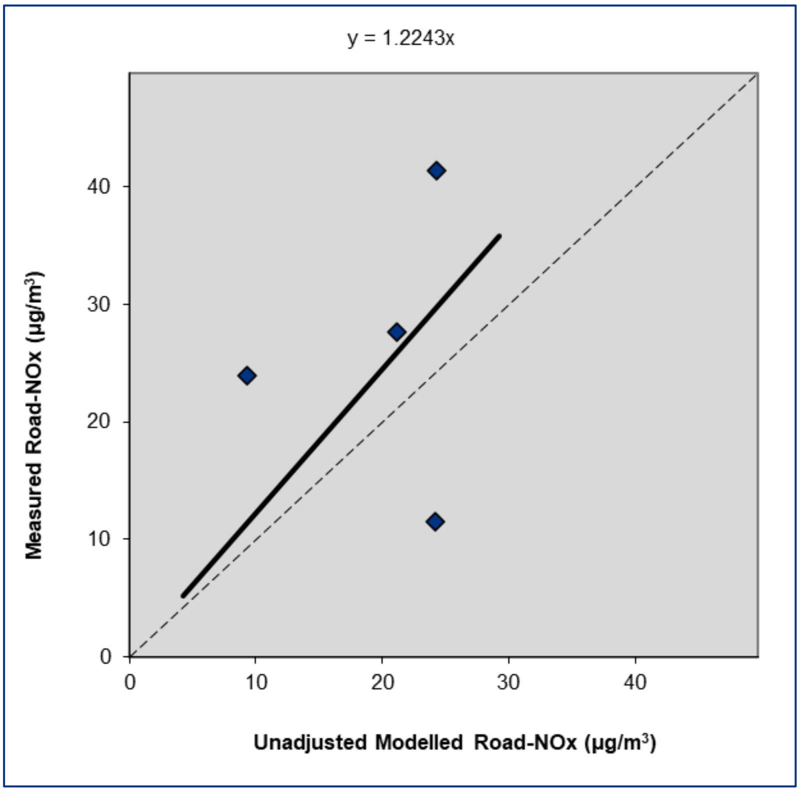

Figure 14: Comparison of Measured Road NOx to Unadjusted Modelled Road NOx Concentrations.

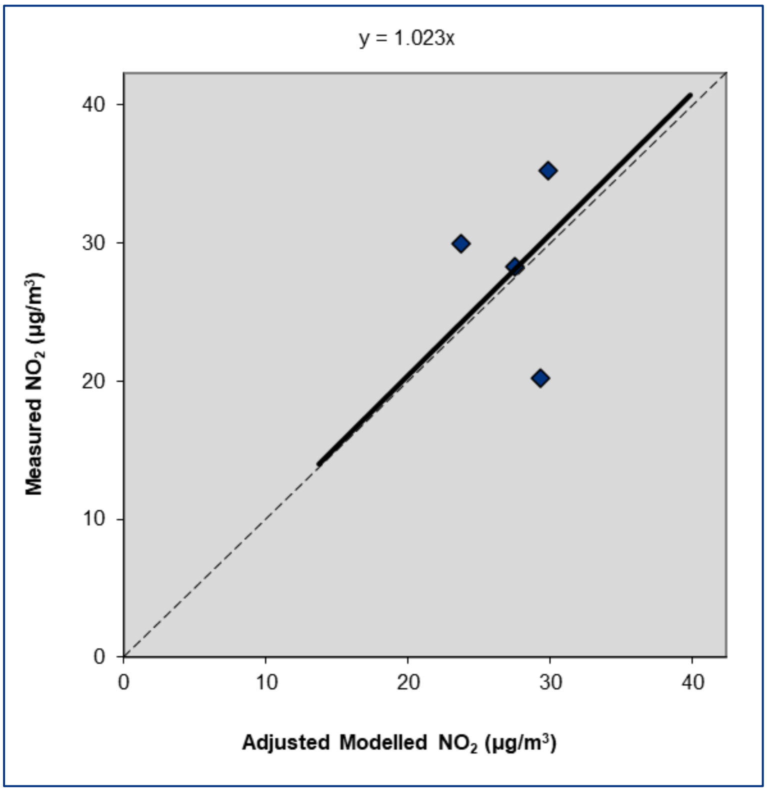

Figure 15: Comparison of Measured Total NO_2 to Primary Adjusted Modelled Total NO_2 Concentrations.

Table A4: Evaluation of Model Performance

Statistical Parameter	Description	Values		
		Before verification (Figure 14)	After verification (Figure 15)	Ideal
Correlation coefficient	Linear relationship between predicted and observed data. Less useful for small datasets as single high/low values can have a large effect.	0.12	-0.08	1
Fractional bias	Identifies systematic tendency to over/under predict (negative = over-predict, positive = under-predict).	0.28	0.03	0.0
Root mean square error (RMSE)	Average error of the model (µg/m³). Ideally within 10% of the annual mean NO_2 objective, i.e., 4 µg/m³; however, within 25% acceptable, i.e., 10 µg/m³.	13.32	6.16	0.0

A2 Professional Experience

Bob Thomas, BSc (Hons) PgDip MSc MIEnvSc MIAQM CSci

Bob Thomas is a Director at AQA, with over 21 years working in the sciences and over 17 years' experience in the field of air quality management and assessment. He has carried out air quality assessments for a wide range of developments, including residential, commercial, industrial, minerals and waste developments. He has been responsible for air quality projects that include ambient air quality monitoring of nitrogen dioxide, dust and PM_{10}, the assessment of nuisance odours and dust, and the preparation of Review and Assessment reports for local authorities. He has extensive dispersion modelling experience for road traffic, energy centre and industrial sources, and has completed many stand-alone reports and chapters for inclusion within an Environmental Statement. Bob has worked with a variety of clients to provide expert air quality services and advice, including local authorities, planners, developers, architects and process operators, and has provided expert witness services at public inquiry. He is a Chartered Scientist, a Member of the Institute of Air Quality Management and a Member of the Institution of Environmental Sciences.

A full CV for Bob Thomas is available at http://aqassessments.co.uk/about

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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, https://publications.naturalengland.org.uk/publication/4720542048845824

2 Winchester City Council (2024) Winchester Local Plan 2020-2040: Transport Assessment Strategic Transport Assessment, July 2024, https://www.localplan.winchester.gov.uk/LibraryAssets/attach/177/Strategic-Transport-Assessment-July-2024.pdf

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