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Havant Borough Council

Air Quality Habitats Regulations Assessment

Air Quality Screening Assessment

2026-07-14

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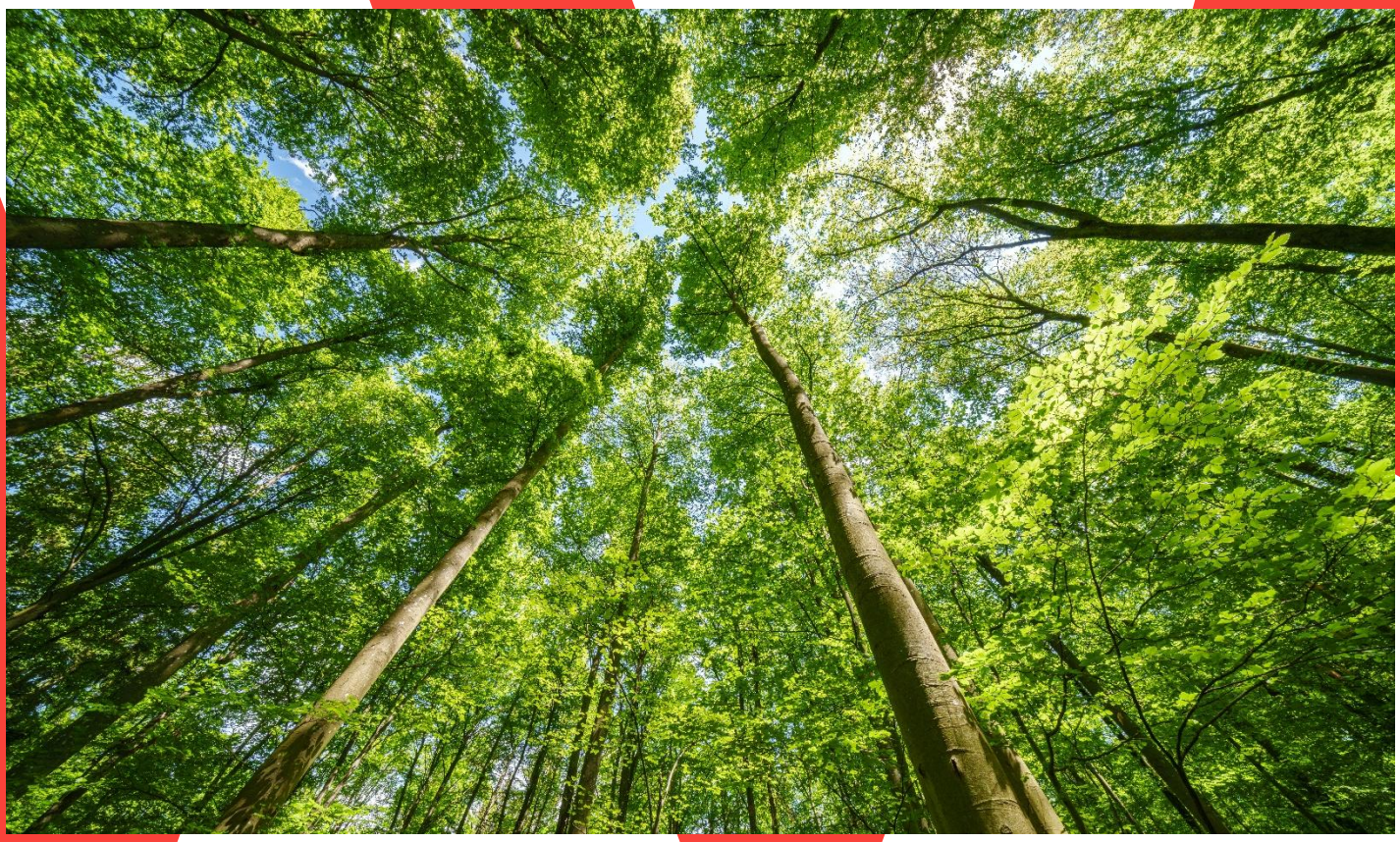

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Havant Borough Council

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Prepared for

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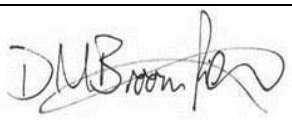
Reviewed by:	Mark Broomfield	14/07/2026	
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Revisions

Rev	Date	Details
	2026-06-11	Draft, pending inclusion of in combination assessment
	2026-07-06	Complete draft, including the in combination assessment
	2026-07-14	Final report

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Abbreviations and glossary

Abbreviations

Abbreviation	Description
AERMET	Meteorological pre-processor for AERMOD
AERMOD	US EPA air dispersion model
APIS	Air Pollution Information System
CREAM	Calculator for Road Emissions of Ammonia
CL	Critical Load / Critical Level
COA	Census Output Area
CW	Census Ward
Defra	Department for Environment, Food & Rural Affairs
EFT	Emissions Factors Toolkit
GDM	Gateway Demand Model
GIS	Geographic Information System
HBC	Havant Borough Council
HGV	Heavy Goods Vehicle
HRA	Habitats Regulations Assessment
LAEI	London Atmospheric Emissions Inventory
LAQM	Local Air Quality Management
LEIM	Local Economic Impact Model
LGV	Light Goods Vehicle
MDM	Main Demand Model

Abbreviation	Description
NAEI	National Atmospheric Emissions Inventory
NH_3	Ammonia
NO_2	Nitrogen dioxide
NOx	Oxides of nitrogen
NOAA	National Oceanic and Atmospheric Administration
NTEM	National Trip End Model
NTS	National Travel Survey
PC	Process Contribution
PfSH	Partnership for South Hampshire
PTM	Public Transport Model
RMSE	Root Mean Square Error
RTM	Road Traffic Model
SAC	Special Area of Conservation
SIP	Site Improvement Plan
SPA	Special Protection Area
SRTM	Sub-Regional Transport Model
SSSI	Site of Special Scientific Interest
TG(22)	Technical Guidance 2022 (Defra LAQM)
US EPA	United States Environmental Protection Agency

Glossary of terms

Term	Explanation
Adjustment factor	A multiplier applied to modelled concentrations to improve agreement with monitored data.
Airborne concentration	The amount of a pollutant present in the air at a given location (µg/m³).
Assemblage qualification	Criterion used in Ramsar/SPA designation, e.g. where sites support ≥20,000 waterfowl.
Background concentration	Pollution level from all sources except the specific source being assessed.
Critical Level (CL)	Threshold concentration of a pollutant in air above which harmful effects may occur to receptors.
Critical Load (CL)	Threshold deposition rate above which harmful ecological effects may occur.
Deposition	The process by which airborne pollutants are transferred to the ground or vegetation.
Deposition velocity	The rate at which pollutants deposit onto surfaces (m/s).
Dispersion kernel	Mathematical representation of how emissions spread from a source in modelling.
Fleet composition	The proportion of different vehicle types (e.g. petrol, diesel, electric) in traffic modelling.
Habitat integrity	The ability of a site to maintain its conservation objectives and qualifying features.
In combination effects	Impacts arising from the combined effect of multiple plans or projects.
Model validation	Comparison of model outputs with measured data to assess performance.
Model verification	Process of refining a model using monitoring data to improve accuracy.
Process Contribution (PC)	The predicted contribution of emissions from a specific plan or source to pollutant levels.
Qualifying features	Species or habitats for which a designated site is protected.
Ramsar site	Wetland designated as internationally important under the Ramsar Convention.
Screening threshold	A criterion (commonly 1% of CL/critical level) used to determine if impacts are insignificant.
Site Improvement Plan (SIP)	A strategic plan identifying pressures and required actions for protected sites.
Special Area of Conservation (SAC)	European designated site under the Habitats Directive.
Special Protection Area (SPA)	European designated site under the Birds Directive.

1. Introduction

The Borough of Havant is located in South Hampshire. There are approximately 127,000 people living within the Havant Borough area of 55 km^2. Havant Borough Council (HBC) is preparing its "Building a Better Future" Plan ("the Plan"), building on work carried out for the previous Havant Borough Local Plan 2036. The purpose of this assessment is to determine whether the Plan will result in potential adverse effects on internationally designated nature conservation sites as a result of air pollution pathways associated with implementation of the Plan.

1.1 This report

This report presents the findings of the air quality screening assessment undertaken in support of the Habitats Regulations Assessment (HRA) process. The assessment focuses on the potential impacts of emissions to air, specifically nitrogen deposition, acid deposition, ammonia (NH_3) concentrations and oxides of nitrogen (NO_x) concentrations, as applicable to the internationally designated nature conservation sites located within Havant and a surrounding 10km buffer area.

Process contributions of the Plan to emissions to air have been derived using appropriate dispersion modelling techniques and have been compared against relevant critical loads and critical levels for the identified habitats.

In accordance with current regulatory guidance, the assessment applies a screening threshold of 1% of the relevant critical load or level to determine whether impacts can be screened out as not likely to be significant. Where process contributions are below this threshold, effects due to the plan alone are considered to be insignificant. Where the threshold is exceeded, further consideration within the HRA process may be required.

The results of the screening assessment are presented in both tabular and graphical form, including identification of the maximum process contributions and the spatial extent of areas where the 1% screening threshold is exceeded (if any). These findings are used to inform the overall HRA conclusion regarding the potential for likely significant effects.

1.2 Habitat site information

Background information and qualifying features

Consideration was given to whether the designated site contains qualifying features that are sensitive to the emissions associated with the planned development. For increased road traffic resulting from the proposed development, the associated emissions include nutrient nitrogen deposition, acid deposition, airborne oxides of nitrogen (NOx) and airborne ammonia (NH_3).

Site screening was carried out by searches on the UK Air Pollution Information System (APIS, apis.ac.uk/appwww.apis.co.uk) and identifying potential sensitivity to air pollution impacts. At this stage, the spatial distribution of qualifying features within each designated site was not considered. If a potentially sensitive feature was identified at the designated site, as determined by APIS listing

a critical load or critical level for at least one pollutant associated with road traffic at that site, it was included in the subsequent stages of the study. Otherwise, the site was screened out of requiring further assessment. The results of this analysis are summarised in Table 1-1.

Table 1-1 Habitat sites and qualifying features within 10km of Havant Borough

Site name	Ramsar site code	SPA site code	SAC site code	Does the site contain qualifying features that are sensitive to emissions from road traffic?
Butser Hill (SAC)			UK0030103	Yes – include in study
Chichester and Langstone Harbours (Ramsar & SPA)	UK11013	UK9011011		Yes – include in study
Kingley Vale (SAC)			UK0012767	Yes – include in study
Pagham Harbour (Ramsar & SPA)	UK11052	UK9012041		Yes – include in study
Portsmouth Harbour (Ramsar & SPA)	UK11055	UK9011051		Yes – include in study
Solent and Dorset Coast (SPA)		UK9020330		Yes – include in study
Solent and Isle of Wight Lagoons (SAC)			UK0017073	Yes – include in study
Solent and Southampton Water (Ramsar & SPA)	UK11063	UK9011061		Yes – include in study
Solent Maritime (SAC)			UK0030059	Yes – include in study
South Wight Maritime			UK0030061	No – designated features are predominantly marine habitats with low sensitivity/ limited pathway for road traffic emissions.

1.3 Air Quality Modelling Assessment

1.3.1 Transport modelling

The air quality modelling assessment was based on the Solent Transport's Sub-Regional Transport Model (SRTM) (see Appendix A.3 for more information on the SRTM).

SYSTRA was commissioned to apply to apply Solent Transport's Sub-Regional Transport Model (SRTM) to inform the update to Havant Local Plan that includes growth through to 2046. The SRTM has been used to model the Local Plan proposed land allocations and identify key transport implications resulting from the scale and location of the development proposed through the Local Plan.

To assess the transport impacts of the Local Plan, two model scenarios were developed:

- **2046 Baseline**, no Havant Local Plan development allocations
- **2046 Do Minimum**, with full Havant Local Plan development allocations

A 2019 Base scenario was also provided for the purposes of modelling a historic reference year for this project.

1.3.2 Model validation

Baseline air quality dispersion modelling of NOx and NH_3 concentrations was completed for the year 2024, based on the 2019 Base transport model, which was scaled to 2024 using Department for Transport traffic count data. NOx and NH_3 concentrations were modelled at a 3m by 3m resolution. NOx modelled concentrations were validated against 2024 measured annual mean NO_2 concentrations in Havant, and a model adjustment factor was calculated for NOx concentrations.

1.3.3 Future year 2046 modelling

Air quality dispersion modelling was carried out for the two 2046 future years scenarios, for 2046 Baseline with no Havant Local Plan development allocations; and for 2046 Do Minimum, with full Havant Local Plan development allocations – hereafter referred to as "the Plan" Scenario. Modelled NOx concentrations were adjusted using the factor derived from the baseline modelling, and total NO_2 concentrations were calculated for the modelled domain.

In addition to total average annual NOx, NO_2 and NH_3 concentrations; average annual nutrient nitrogen deposition and acid deposition were calculated for both short and long vegetation.

The 2046 Baseline (without Plan development) results were subtracted from the 2046 "Plan" Scenario, to determine the impact (or the modelled "contribution") of the plan for all potentially relevant pollutants at every receptor point.

1.3.4 Evaluation of results

The maximum process contribution of “the Plan” Scenario within each habitat site was evaluated against the relevant critical loads and levels. Increases of less than 1% of the critical load or level can be screened out. Increases greater than 1% would require HRA Stage 2: Appropriate Assessment.

2. Assessment of air quality impacts on designated sites

This chapter provides information on each designated site under consideration, and summarises the findings of the air quality screening assessment for that site.

2.1 Butser Hill SAC (UK0030103)

2.1.1 Background information and qualifying features

Underlying Sites of Special Scientific Interest (SSSI): Butser Hill SSSI

Qualifying and notifiable features associated with this site comprise: **6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites); European dry heaths** and **91J0 *Taxus baccata* woods of the British Isles.**

The Site Improvement Plan (SIP) states that nitrogen deposition has been identified as a threat to both qualifying feature habitats of this European site (Natural England, 2014a).

The conservation objectives stated for this are to ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

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

2.1.2 HRA Stage 1: Assessment of air quality impacts against screening thresholds

Table 2-1 summarizes all of the critical loads for nutrient nitrogen deposition (kgN/ha-year) and acid deposition (kEq/ha-year), as well as the critical levels for airborne ammonia (µg/m^3), applicable to this designated site. The most stringent critical load or critical level (CL) for each pollutant is indicated in bold. The critical level for airborne NOx is set at 30 µg/m^3 across all designated sites.

Table 2-1 Minimum Critical Load and Critical Level (CL) values and associated sensitive features for Butser Hill SAC

Sensitive feature	Minimum nutrient nitrogen deposition CLs (kgN/ha-year)	Minimum acid deposition CLs (MinCLMaxN, kEq/ha-year)	Minimum airborne NH_3 CLs (µg/m^3)
Taxus baccata woods of the British Isles	10	2.113	3
European dry heaths	**5**	**1.059**	**1**
Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)	10	4.856	**1**

Screening results

Table 2-2 compares the maximum modelled contribution of the Havant "Plan" Scenario to the lowest applicable CL. This designated site is mainly characterised by marine habitats with short vegetation, and in these areas, the grassland deposition rates are applicable. There is a wedge-shaped woodland section of the site located north of the A27 where taller vegetation is present and where forest deposition rates are applicable. This screening exercise represents a precautionary approach, as it assumes that the most sensitive qualifying features (with the lowest CLs) are present in the areas with the highest modelled contribution (typically adjacent to the busiest road).

All four pollutants fall well below the 1% screening threshold for the Havant "Plan" Scenario. On the basis of available evidence and agreed thresholds, likely significant effects from air quality impacts can be ruled-out.

Table 2-2 Screening results based on dispersion modelling of Havant "Plan" Scenario

Pollutant	Deposition type	Minimum CL	Maximum modelled contribution	% of CL
Nutrient nitrogen deposition (kgN/ha-year)	Forest	5	0.0034	0.07%
	Grassland	5	0.0001	<0.01%
Acid deposition (kEq/ha-year)	Forest	1.059	0.0002	0.02%
	Grassland	1.059	0.0001	0.01%
Airborne NOx (µg/m^3)	n/a	30	0.0227	0.08%
Airborne NH_3 (µg/m^3)	n/a	1	2.58×10^{-5}	<0.01%

2.2 Chichester and Langstone Harbours Ramsar (UK11013) and SPA (UK9011011)

2.2.1 Ramsar background information and qualifying features

Underlying Sites of Special Scientific Interest (SSSI): Chichester Harbour SSSI, Langstone Harbour SSSI

Qualifying and notifiable features associated with this site include:

Ramsar Criterion 1: Two large estuarine basins linked by the channel which divides Hayling Island from the main Hampshire coastline. The site includes intertidal mudflats, saltmarsh, sand and shingle spits and sand dunes.

Ramsar Criterion 5: Assemblages of international importance: Species with peak counts in winter: 76480 waterfowl (5 year peak mean 1998/99-2002/2003).

Ramsar Criterion 6: Qualifying Species/populations (as identified at designation):

Species with peak counts in spring/autumn:	
Ringed plover, *Charadrius hiaticula*, Europe/Northwest Africa	853 individuals, representing an average of 1.1% of the population (5 year peak mean 1998/92002/3)
Black-tailed godwit, *Limosa limosa islandica*, Iceland/W Europe	906 individuals, representing an average of 2.5% of the population (5 year peak mean 1998/92002/3)
Common redshank, *Tringa totanus totanus*	2577 individuals, representing an average of 1% of the population (5 year peak mean 1998/92002/3)
Species with peak counts in winter:	
Dark-bellied brent goose, *Branta bernicla bernicla*	12987 individuals, representing an average of 6% of the population (5 year peak mean 1998/92002/3)
Common shelduck, *Tadorna tadorna*, NW Europe	1468 individuals, representing an average of 1.8% of the GB population (5 year peak mean 1998/9-2002/3)
Grey plover, *Pluvialis squatarola*, E Atlantic/W Africa -wintering	3043 individuals, representing an average of 1.2% of the population (5 year peak mean 1998/9-2002/3)
Dunlin, *Calidris alpina alpina*, W Siberia/W Europe	33436 individuals, representing an average of 2.5% of the population (5 year peak mean 1998/9-2002/3

Species/populations identified subsequent to designation for possible future consideration under criterion 6.

Species regularly supported during the breeding season:	
Little tern, *Sterna albifrons albifrons*, W Europe	130 apparently occupied nests, representing an average of 1.1% of the breeding population (Seabird 2000 Census)

The Site Improvement Plan for the overlapping SPA (Solent SIP043) states that nitrogen deposition has been identified as a pressure (Natural England, 2014b). Ramsar sites do not have Site Improvement Plans.

2.2.2 SPA background information and qualifying features

Underlying Sites of Special Scientific Interest (SSSI): Chichester Harbour SSSI, Langstone Harbour SSSI.

The site qualifies under **Article 4.1** of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive:

During the breeding season:	
Common Tern *Sterna hirundo*	33 pairs representing up to 0.3% of the breeding population in Great Britain (5 year mean, 1992-1996)
Little Tern *Sterna albifrons*	100 pairs representing up to 4.2% of the breeding population in Great Britain (5 year mean, 1992-1996)
Sandwich Tern *Sterna sandvicensis*	158 pairs representing up to 1.1% of the breeding population in Great Britain (1998)
Over winter:	
Bar-tailed Godwit *Limosa lapponica*	1,692 individuals representing up to 3.2% of the wintering population in Great Britain (5 year peak mean 1991/2 - 1995/6)

The site also qualifies under **Article 4.2** of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species:

Over winter:	
Curlew *Numenius arquata*	1861 individuals representing up to 1.6% of the European - breeding population (5 year peak mean 1991/92-1995/96)
Dark-bellied Brent Goose **Branta bernicla bernicla**	17,119 individuals representing up to 5.7% of the wintering Western Siberia/Western Europe population (5 year peak mean 1991/2 - 1995/6)

Over winter:	
Dunlin **Calidris alpina alpina**	44,294 individuals representing up to 3.2% of the wintering Northern Siberia/Europe/Western Africa population (5 year peak mean 1991/2 - 1995/6)
Grey Plover **Pluvialis squatarola**	3,825 individuals representing up to 2.3% of the Eastern Atlantic - wintering population (5 year peak mean 1991/2 - 1995/6)
Pintail *Anas acuta*	330 individuals representing (up to 1.2% of the North-western Europe population (5 year peak mean 1991/92-1995/96)
Redshank **Tringa totanus**	1,788 individuals representing up to 1% of the Eastern Atlantic - wintering population (5 year peak mean 1991/2 - 1995/6)
Red-breasted Merganser *Mergus serrator*	297 individuals representing up to 3% of the North-western/Central Europe population (5 year peak mean 1991/92-1995/96)
Sanderling *Calidris alba*	236 individuals representing up to 0.2% (Eastern Atlantic/Western & Southern Africa - wintering) of the Eastern Atlantic/Western & Southern Africa - wintering population (5 year peak mean 1991/92-1995/96)
Shelduck *Tadorna tadorna*	2410 individuals representing up to 3.3% of the North-western Europe population (5 year peak mean 1991/92-1995/96)
Shoveler *Anas clypeata*	100 individuals representing up to 1% of the North-western/Central Europe population (5 year peak mean 1991/92-1995/96)
Teal *Anas crecca*	1824 individuals representing up to 0.5% of the North-western Europe population (5 year peak mean 1991/92-1995/96)
Turnstone *Arenaria intrepes*	430 individuals representing up to 0.7% of the Western Palearctic – wintering population (5 year peak mean 1991/92-1995/96)
Wigeon *Anas penelope*	2055 individuals representing up to 0.7% of the Western Siberia/North-western/North-eastern Europe population (5 year peak mean 1991/92-1995/96)
Ringed Plover **Charadrius hiaticula**	846 individuals representing up to 3% of the Europe/Northern Africa - wintering population (5 year peak mean 1991/2 - 1995/6)

Assemblage qualification: The site qualifies as a wetland of international importance underArticle 4.2 of the Directive (79/409/EEC) by regularly supporting at least 20,000 waterfowl.

Over winter, the area regularly supports 93,230 individual waterfowl (5 year peak mean 1991/2 - 1995/6) including: Bar-tailed godwit, curlew, dark-bellied Brent geese, dunlin, grey plover, pintail, red-breasted merganser, redshank, ringed plover, sanderling, shelduck, shoveler, teal, turnstone and wigeon.

The Site Improvement Plan (SIP043) states that nitrogen deposition has been identified as a pressure (Natural England, 2014b)

The conservation objectives for this site are to 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.

2.2.3 HRA Stage 1: Assessment of air quality impacts against screening thresholds

Table 2-3 summarizes all of the critical loads for nutrient nitrogen deposition (kgN/ha-year) and acid deposition (kEq/ha-year), as well as the critical levels for airborne ammonia (µg/m^3), applicable to this designated site. In this table, the most stringent critical load or critical level (CL) for each pollutant is indicated in bold. The critical level for airborne NOx is set at 30 µg/m^3 across all designated sites.

Table 2-3 Minimum Critical Load and Critical Level (CL) values and associated sensitive features for Chichester and Langstone Harbours Ramsar and SPA

Sensitive feature	Minimum nutrient nitrogen deposition CLs (kgN/ha-year)	Minimum acid deposition CLs (MinCLMaxN, kEq/ha-year)	Minimum airborne NH_3 CLs (µg/m^3)
Sterna sandvicensis (Western Europe/Western Africa) - Sandwich tern	**5**	Not sensitive	**1 or 3**
Sterna hirundo (Northern/Eastern Europe - breeding) - Common tern	**5**	Not sensitive	**1 or 3**
Sterna albifrons (Eastern Atlantic - breeding) - Little tern	**5**	Not sensitive	**1 or 3**

Sensitive feature	Minimum nutrient nitrogen deposition CLs (kgN/ha-year)	Minimum acid deposition CLs (MinCLMaxN, kEq/ha-year)	Minimum airborne NH_3 CLs (µg/m^3)
Branta bernicla bernicla (Western Siberia/Western Europe) - Dark-bellied brent goose	10	Not sensitive	**1 or 3**
Tadorna tadorna (North-western Europe) - Common shelduck	10	Not sensitive	**1 or 3**
Anas penelope (Western Siberia/North-western/North-eastern Europe) - Eurasian wigeon	10	Not sensitive	**1 or 3**
Anas crecca (North-western Europe) - Eurasian teal	10	Not sensitive	**1 or 3**
Anas acuta (North-western Europe) - Northern pintail	10	Not sensitive	**1 or 3**
Mergus serrator (North-western/Central Europe) - Red-breasted merganser	10	Not sensitive	**1 or 3**
Charadrius hiaticula (Europe/Northern Africa - wintering) - Ringed plover	10	Not sensitive	**1 or 3**
Pluvialis squatarola (Eastern Atlantic - wintering) - Grey plover	10	Not sensitive	**1 or 3**
Calidris alba (Eastern Atlantic/Western & Southern Africa - wintering) - Sanderling	10	Not sensitive	**1 or 3**
Calidris alpina alpina (Northern Siberia/Europe/Western Africa) - Dunlin	10	Not sensitive	3
Limosa lapponica (Western Palearctic - wintering) - Bar-tailed godwit	10	Not sensitive	**1 or 3**
Numenius arquata (Europe - breeding) - Eurasian curlew	10	**4.856**	3
Tringa totanus (Eastern Atlantic - wintering) - Common redshank	10	Not sensitive	**1 or 3**
Arenaria interpres (Western Palearctic - wintering) - Ruddy turnstone	10	Not sensitive	**1 or 3**
Anas clypeata (North-western/Central Europe) - Northern shoveler	10	No data	**1 or 3**

Screening results

Table 2-4 compares the maximum modelled contribution of the Havant “Plan” Scenario to the lowest applicable CL. This designated site is mainly characterised by marine habitats with short vegetation, and in these areas, the grassland deposition rates are applicable. There is a wedge-shaped

woodland section of the site located north of the A27 where taller vegetation is present and where forest deposition rates are applicable. This screening exercise represents a precautionary approach, as it assumes that the most sensitive qualifying features (with the lowest CLs) are present in the areas with the highest modelled contribution (typically adjacent to the busiest road).

All four pollutants fall below the 1% screening threshold for the Havant "Plan" Scenario. On the basis of available evidence and agreed thresholds, likely significant effects from air quality impacts can be ruled-out.

Table 2-4 Screening results based on dispersion modelling of Havant "Plan" Scenario

Pollutant	Deposition type	Minimum CL	Maximum modelled contribution	% of CL
Nutrient nitrogen deposition (kgN/ha-year)	Forest	5	0.0084	0.17%
	Grassland	5	0.0042	0.08%
Acid deposition (kEq/ha-year)	Forest	4.856	0.0006	0.01%
	Grassland	4.856	0.0003	<0.01%
Airborne NOx (µg/m^3)	n/a	30	0.0605	0.20%
Airborne NH_3 (µg/m^3)	n/a	1	4.19 x10^{-5}	<0.01%

2.3 Kingley Vale SAC (UK0012767)

2.3.1 Background information and qualifying features

Underlying Sites of Special Scientific Interest (SSSI): Kingley Vale SSSI.

Qualifying and notifiable features associated with this site include: **91J0 *Taxus baccata* woods of the British Isles** and **6210 Semi-natural dry grasslands** and **scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites).**

The Site Improvement Plan (SIP 114) states that nitrogen deposition has been identified as a pressure (Natural England, 2015).

The conservation objectives for this site are to 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,
- The structure and function (including typical species) of qualifying natural habitats, and,
- The supporting processes on which qualifying natural habitats rely.

2.3.2 HRA Stage 1: Assessment of air quality impacts against screening thresholds

Table 2-5 summarizes all of the critical loads for nutrient nitrogen deposition (kgN/ha-year) and acid deposition (kEq/ha-year), as well as the critical levels for airborne ammonia (µg/m^3), applicable to this designated site. The most stringent critical load or critical level (CL) for each pollutant is indicated in bold. The critical level for airborne NOx is set at 30 µg/m^3 across all designated sites.

Table 2-5 Minimum Critical Load and Critical Level (CL) values and associated sensitive features for Kingley Vale SAC

Sensitive feature	Minimum nutrient nitrogen deposition CLs (kgN/ha-year)	Minimum acid deposition CLs (MinCLMaxN, kEq/ha-year)	Minimum airborne NH_3 CLs (µg/m^3)
Taxus baccata woods of the British Isles	10	11.166	3
Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites)	10	**4.856**	**1**
European dry heaths	**5**	5.052	**1**
Juniperus communis formations on heaths or calcareous grasslands (Calcareous grassland (using base cation))	10	**4.856**	**1**
Juniperus communis formations on heaths or calcareous grasslands (Dwarf shrub heath/dry heath)	**5**	5.052	3

Screening results

Table 2-6 compares the maximum modelled contribution of the Havant “Plan” Scenario to the lowest applicable CL. This designated site contains areas with tall vegetation as well as short vegetation, and both forest and grassland deposition rates are included in the table as they are applicable to different areas of the site. Values highlighted in yellow exceed the 1% screening threshold. This screening exercise represents a precautionary approach, as it assumes that the most sensitive qualifying features (with the lowest CLs) are present in the areas with the highest modelled contribution (typically adjacent to the busiest road).

The screening results indicate that air quality impacts for all pollutants associated with the "Plan", are well below the 1% screening threshold, with maximum modelled values representing no more than 0.01% of the CL. Based on the small modelled contribution of the HBLP to air quality impacts on Kingley Vale SAC, and the qualitative findings of the HRAs summarized in the preceding section, likely significant effects can be discounted for nitrogen deposition, acid deposition, NH_3 and NOx as causal pollutants arising from increased road emissions associated with "the Plan" (either alone or in combination). No further HRA stages are required for air quality impacts.

Table 2-6 Screening results based on dispersion modelling of Havant "Plan" Scenario

Pollutant	Deposition type	Minimum CL	Maximum modelled contribution	% of CL
Nutrient nitrogen deposition (kgN/ha-year)	Forest	5	3.0×10^{-5}	<0.01%
	Grassland	5	1.57×10^{-5}	<0.01%
Acid deposition (kEq/ha-year)	Forest	4.856	2.2×10^{-6}	<0.01%
	Grassland	4.856	1.12×10^{-6}	<0.01%
Airborne NOx ($\mu g/m^3$)	n/a	30	0.00020	<0.01%
Airborne NH_3 ($\mu g/m^3$)	n/a	1	5.0×10^{-7}	<0.01%

2.4 Pagham Harbour Ramsar (UK11052) and SPA (UK9012041)

2.4.1 Ramsar background information and qualifying features

Underlying Sites of Special Scientific Interest (SSSI): Pagham Harbour SSSI.

Qualifying and notifiable features associated with this site include:

Ramsar Criterion 6: species/populations occurring at levels of international importance.

Qualifying Species/populations (as identified at designation): Species with peak counts in winter:	
Dark-bellied brent goose, *Branta bernicla bernicla*	2512 individuals, representing an average of 1.1% of the population (5 year peak mean 1998/9-2002/3)
Species/populations identified subsequent to designation for possible future consideration under criterion 6. Species with peak counts in winter:	
Black-tailed godwit, *Limosa limosa islandica*, Iceland/W Europe	377 individuals, representing an average of 1% of the population (5 year peak mean 1998/92002/3)

The Site Improvement Plan (SIP) for the overlapping SPA has not identified air pollution as a pressure or threat (Natural England, 2014c). Ramsar sites do not have Site Improvement Plans.

2.4.2 SPA background information and qualifying features

Underlying Sites of Special Scientific Interest (SSSI): Pagham Harbour SSSI.

The site qualifies under **Article 4.1** of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive:

During the breeding season:	
Little Tern *Sterna albifrons*	7 pairs representing 0.3% of the breeding population in Great Britain (5 year mean 1992-96)
Common Tern Sterna Hirundo	No figures are provided on the Standard Data Form for this species.
Over winter:	
Ruff **Philomachus pugnax**	101 individuals representing at least 1.4% of the Western Africa - wintering population (5 year peak mean 1991/92 – 1995/96)

The site also qualifies under **Article 4.2** of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species:

Over winter:	
Dark-bellied Brent goose *Branta bernicla bernicla*	17941 individuals representing at least 0.6% of the wintering western Siberia/western Europe population (5 year peak mean 1991/2 - 1995/6)

The Site Improvement Plan (SIP) for the SPA has not identified air pollution as a pressure or threat (Natural England, 2014c).

The conservation objectives for this site are to 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.

Table 2-7 Minimum Critical Load and Critical Level (CL) values and associated sensitive features for Pagham Harbour SPA

Sensitive feature	Minimum nutrient nitrogen deposition CLs (kgN/ha-year)	Minimum acid deposition CLs (MinCLMaxN, kEq/ha-year)	Minimum airborne NH_3 CLs (µg/m^3)
Branta bernicla bernicla – Dark-bellied brent goose	10	Not sensitive	**3**
Philomachus pugnax (Western Africa - wintering) – Ruff	10	**4.856**	**3**
Sterna albifrons (Eastern Atlantic - breeding) – Little tern	**5**	**4.856**	**3**
Sterna hirundo (Northern/Eastern Europe - breeding) – Common tern	**5**	**4.856**	**3**

2.4.3 HRA Stage 1: Assessment of impacts against screening thresholds

Screening results

Table 2-8Table 2-10 compares the maximum modelled contribution of the Havant "Plan" to the lowest applicable CL. This designated site is characterized by marine habitats with short vegetation, and the grassland deposition rates are applicable throughout. This screening exercise represents a precautionary approach, as it assumes that the most sensitive qualifying features (with the lowest CLs) are present in the areas with the highest modelled contribution (typically adjacent to the busiest road).

None of the pollutants exceeded the 1% screening threshold for the Havant "Plan" Scenario. On the basis of available evidence and agreed thresholds, likely significant effects from air quality impacts can be ruled out for the Plan in isolation.

Table 2-8 Screening results based on dispersion modelling of Havant "Plan" Scenario

Pollutant	Deposition type	Minimum CL	Maximum modelled contribution	% of CL
Nutrient nitrogen deposition (kgN/ha-year)	Forest	5	9.4×10^{-7}	<0.01%
	Grassland	5	4.9×10^{-7}	<0.01%
Acid deposition (kEq/ha-year)	Forest	4.856	6.7×10^{-8}	<0.01%

Pollutant	Deposition type	Minimum CL	Maximum modelled contribution	% of CL
	Grassland	4.856	3.5×10^{-8}	<0.01%
Airborne NOx ($\mu g/m^3$)	n/a	30	4.8×10^{-6}	<0.01%
Airborne NH_3 ($\mu g/m^3$)	n/a	1	1.5×10^{-8}	<0.01%

2.5 Portsmouth Harbour Ramsar (UK11055) and SPA (UK9011051)

2.5.1 Ramsar background information and qualifying features

Underlying Sites of Special Scientific Interest (SSSI): Portsmouth Harbour SSSI.

Qualifying and notifiable features associated with this site include:

Ramsar Criterion 3: The intertidal mudflat areas possess extensive beds of eelgrass *Zostera angustifolia* and *Zostera noltei* which support the grazing dark-bellied brent geese *Branta bernicla bernicla* populations. The mud-snail *Hydrobia ulvae* is found at extremely high densities, which helps to support the wading bird interest of the site. Common cord-grass *Spartina anglica* dominates large areas of the saltmarsh and there are also extensive areas of green algae *Enteromorpha* spp. and sea lettuce *Ulva lactuca*. More locally the saltmarsh is dominated by sea purslane *Halimione portulacoides* which gradates to more varied communities at the higher shore levels. The site also includes a number of saline lagoons hosting nationally important species.

Ramsar Criterion 6: Species/populations occurring at levels of international importance

Qualifying Species/populations (as identified at designation): Species with peak counts in winter:	
Dark-bellied brent goose, *Branta bernicla bernicla*	2105 individuals, representing an average of 2.1% of the GB population (5 year peak mean 1998/9-2002/3)

The Site Improvement Plan for the overlapping SPA (Solent SIP043) states that nitrogen deposition has been identified as a pressure (Natural England, 2014b). Ramsar sites do not have Site Improvement Plans.

2.5.2 SPA background information and qualifying features

Underlying Sites of Special Scientific Interest (SSSI): Portsmouth Harbour SSSI.

The site qualifies under **Article 4.2** of the Directive (79/409/EEC) by supporting populations of European importance of the following wintering species.

Over winter:	
Dark-bellied Brent Goose **Branta bernicla bernicla**	2,847 individuals representing 0.9% of the wintering Western Siberia/Western Europe population (5 year peak mean 1991/2 - 1995/6)
Black-tailed godwit *Limosa limosa islandica*	31 individuals representing 0.4% of the population in Great Britain (5 year peak mean 1991/92-1995/96)
Dunlin *Calidris alpine alpina*	5123 individuals representing 1% of the population in Great Britain 5 year peak mean 1991/92-1995/96

Over winter:	
Red-breasted merganser *Mergus serrator*	87 individuals representing 0.9% of the population in Great Britain (5 year peak mean 1991/92-1995/96)

The Site Improvement Plan (SIP043) states that nitrogen deposition has been identified as a pressure (Natural England, 2014b).

The conservation objectives for this site are to 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.

2.5.3 HRA Stage 1: Assessment of air quality impacts against screening thresholds

Table 2-9 summarizes all of the critical loads for nutrient nitrogen deposition (kgN/ha-year) and acid deposition (kEq/ha-year), as well as the critical levels for airborne ammonia (µg/m^3), applicable to this designated site. The most stringent critical load or critical level (CL) for each pollutant is indicated in bold. The critical level for airborne NOx is set at 30 µg/m^3 across all designated sites.

Table 2-9 Minimum Critical Load and Critical Level (CL) values and associated sensitive features for Portsmouth Harbour Ramsar and SPA

Sensitive feature	Minimum nutrient nitrogen deposition CLs (kgN/ha-year)	Minimum acid deposition CLs (MinCLMaxN, kEq/ha-year)	Minimum airborne NH_3 CLs (µg/m^3)
Branta bernicla bernicla (Western Siberia/Western Europe) - Dark-bellied brent goose	**10**	Not sensitive	**1 or 3**
Mergus serrator (North-western/Central Europe) - Red-breasted merganser	**10**	Not sensitive	**1 or 3**
Calidris alpina alpina (Northern Siberia/Europe/Western Africa) - Dunlin	No data	Not sensitive	No data

Sensitive feature	Minimum nutrient nitrogen deposition CLs (kgN/ha-year)	Minimum acid deposition CLs (MinCLMaxN, kEq/ha-year)	Minimum airborne NH_3 CLs (µg/m^3)
Limosa limosa islandica (Iceland - breeding) - Black-tailed godwit	**10**	Not sensitive	**1 or 3**

Screening results

Table 2-10 compares the maximum modelled contribution of the Havant "Plan" to the lowest applicable CL. This designated site is characterized by marine habitats with short vegetation, and the grassland deposition rates are applicable throughout. This screening exercise represents a precautionary approach, as it assumes that the most sensitive qualifying features (with the lowest CLs) are present in the areas with the highest modelled contribution (typically adjacent to the busiest road).

None of the pollutants exceeded the 1% screening threshold for the Havant "Plan" Scenario. On the basis of available evidence and agreed thresholds, likely significant effects from air quality impacts can be ruled out for the Plan in isolation.

Table 2-10 Screening results based on dispersion modelling of Havant "Plan" Scenario

Pollutant	Deposition type	Minimum CL	Maximum modelled contribution	% of CL
Nutrient nitrogen deposition (kgN/ha-year)	Grassland	10	0.0030	0.03%
Acid deposition (kEq/ha-year)	Grassland	Not sensitive	0.0002	n/a
Airborne NOx (µg/m^3)	n/a	30	0.0439	0.15%
Airborne NH_3 (µg/m^3)	n/a	3	2.4 x 10-5	<0.01%

2.6 Solent and Dorset Coast SPA (UK9020330)

2.6.1 Background information and qualifying features

Underlying Sites of Special Scientific Interest (SSSI):

South Dorset Coast SSSI, Townsend SSSI, Purbeck Ridge (West & East) SSSI, Studland Cliffs SSSI, Studland & Godlingson SSSI, Poole Bay Cliffs SSSI, Christchurch Harbour SSSI, Avon Valley (Bickton to Christchurch) SSSI, River Avon SSSI, Christchurch Harbour SSSI, Highcliffe to Milford Cliffs SSSI, Hurst Castle and Lymington River Estuary SSSI, North Solent SSSI, Dibden Bay SSSI, Hythe to Calshot Marshes SSSI, Lee-on-Solent to Itchen Estuary SSSI, Titchfield Haven SSSI, Browndown SSSI, Portsmouth Harbour SSSI, Chichester Harbour SSSI, Langstone Harbour SSSI, Sinah Common SSSI, Bracklesham Bay SSSI, Pagham Harbour SSSI, Bognor Reef SSSI, Compton Chine to Steephill Cove SSSI, Compton Down SSSI, Headon Warren and West High

Down SSSI, Colwell Bay SSSI, Yar Estuary SSSI, Bouldnor and Hamstead Cliffs SSSI, Newtown Harbour SSSI, Thorness Bay SSSI, King's Quay Shore SSSI, Ryde Sands and Wootton Creek SSSI, Brading Marshes to St Helen's Ledges SSSI, Whitecliff Bay and Bembridge Ledges SSSI, Bembridge Down SSSI.

Qualifying and notifiable features associated with this site include: Sandwich tern *Sterna sandvicensis* (4.01% of GB breeding population), common tern *Sterna hirundo* (4.77% of GB breeding population) and little tern *Sterna albifrons* (3.31% of GB breeding population).

This site was classified in January 2020 (previously the Solent and Dorset Coast potential SPA), and does not have a specific Site Improvement Plan associated with it. Critical Loads do not apply over the sea where the vast majority of this SPA is located.

The conservation objectives for this site are to 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.

2.6.2 HRA Stage 1: Assessment of air quality impacts against screening thresholds

Table 2-11 summarizes all of the critical loads and critical levels (CLs) used for the screening assessment of this potential SPA. As this is a potential designated site, CLs are not yet listed on APIS. The CLs in the table were specified by Natural England for use in screening air quality impacts, based on the qualifying features of this site (tern species) and critical loads applicable to terns at adjacent designated sites.

Table 2-11 Minimum Critical Load and Critical Level (CL) values and associated sensitive features for Solent and Dorset Coast potential SPA

Sensitive feature	Minimum nutrient nitrogen deposition CLs (kgN/ha-year)	Minimum acid deposition CLs (MinCLMaxN, kEq/ha-year)	Minimum airborne NH_3 CLs (µg/m^3)
Sterna albifrons (Eastern Atlantic - breeding)	**5**	**4.856**	**1 or 3**
Sterna hirundo (Northern/Eastern Europe - breeding)	**5**	**4.856**	**1 or 3**
Sterna sandvicensis (Western Europe/Western Africa)	**5**	**4.856**	**1 or 3**

Screening results

Table 2-12 compares the maximum modelled contribution of the Havant "Plan" Scenario to the lowest applicable CL. This designated site is mainly characterised by marine habitats with short vegetation, and the grassland deposition rates are applicable. This screening exercise represents a precautionary approach, as it assumes that the most sensitive qualifying features (with the lowest CLs) are present in the areas with the highest modelled contribution (typically adjacent to the busiest road).

All four pollutants fall well below the 1% screening threshold for the Havant "Plan" Scenario. On the basis of available evidence and agreed thresholds, likely significant effects from air quality impacts can be ruled-out.

Table 2-12 Screening results based on dispersion modelling of Havant "Plan" Scenario

Pollutant	Deposition type	Minimum CL	Maximum modelled contribution	% of CL
Nutrient nitrogen deposition (kgN/ha-year)	Grassland	5	0.0039	0.08%
Acid deposition (kEq/ha-year)	Grassland	4.856	0.0003	<0.01%
Airborne NOx (µg/m^3)	n/a	30	0.0568	0.19%
Airborne NH_3 (µg/m^3)	n/a	3	7.18×10^{-5}	<0.01%

2.7 Solent and Isle of Wight Lagoons SAC (UK0017073)

2.7.1 Background information and qualifying features

Underlying Sites of Special Scientific Interest (SSSI): Brading Marshes to St Helen's Ledges SSSI, Langstone Harbour SSSI, Hurst Castle & Lymington River Estuary SSSI, Gilkicker Lagoon SSSI.

Qualifying and notifiable features associated with this site include: **1150 Coastal lagoons.** The Solent on the south coast of England encompasses a series of Coastal lagoons, including percolation, isolated and sluiced lagoons. The site includes a number of lagoons in the marshes in the Keyhaven – Pennington area, at Farlington Marshes in Chichester Harbour, behind the sea-wall at Bembridge Harbour and at Gilkicker, near Gosport. The lagoons show a range of salinities and substrates, ranging from soft mud to muddy sand with a high proportion of shingle, which support a diverse fauna including large populations of three notable species: the nationally rare foxtail stonewort *Lamprothamnium papulosum*, the nationally scarce lagoon sand shrimp *Gammarus insensibilis*, and the nationally scarce starlet sea anemone *Nematostella vectensis*. The lagoons in Keyhaven – Pennington Marshes are part of a network of ditches and ponds within the saltmarsh behind a sea-wall. Farlington Marshes is an isolated lagoon in marsh pasture that, although separated from the sea by a sea-wall, receives sea water during spring tides. The lagoon holds a well-developed low-medium salinity insect-dominated fauna. Gilkicker Lagoon is a sluiced lagoon with marked seasonal salinity fluctuation and supports a high species diversity. The lagoons at Bembridge Harbour have formed in a depression behind the sea-wall and sea water enters by percolation. Species diversity in these lagoons is high and the fauna includes very high densities of *N. vectensis*.

The Site Improvement Plan (SIP 270) states that nitrogen deposition has been identified as a threat (Natural England, 2014d).

The conservation objectives for this site are to ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

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

2.7.2 HRA Stage 1: Assessment of air quality impacts against screening thresholds

Table 2-13 summarizes all of the critical loads for nutrient nitrogen deposition (kgN/ha-year) and acid deposition (kEq/ha-year), as well as the critical levels for airborne ammonia (µg/m^3), applicable to this designated site. The critical level for airborne NOx is set at 30 µg/m^3 across all designated sites.

Table 2-13 Minimum Critical Load and Critical Level (CL) values and associated sensitive features for Solent and Isle of Wight Lagoons

Sensitive feature	Minimum nutrient nitrogen deposition CLs (kgN/ha-year)	Minimum acid deposition CLs (MinCLMaxN, kEq/ha-year)	Minimum airborne NH_3 CLs (µg/m^3)
Coastal lagoons	**10**	Not sensitive	**3**
Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	**10**	Not sensitive	**3**
Salicornia and other annuals colonizing mud and sand	20	Not sensitive	**3**

Screening results

Table 2-14 compares the maximum modelled contribution of the Havant "Plan" Scenario and to the lowest applicable CL. This designated site is mainly characterized by marine habitats with short vegetation, and the grassland deposition rates are applicable. This screening exercise represents a precautionary approach, as it assumes that the most sensitive qualifying features (with the lowest CLs) are present in the areas with the highest modelled contribution (typically adjacent to the busiest road).

All pollutants fall well below the 1% screening threshold for the Havant "Plan" Scenario. On the basis of available evidence and agreed thresholds, likely significant effects from air quality impacts can be discounted.

Table 2-14 Screening results based on dispersion modelling of Havant "Plan" Scenario

Pollutant	Deposition type	Minimum CL	Maximum modelled contribution	% of CL
Nutrient nitrogen deposition (kgN/ha-year)	Grassland	10	0.0004	<0.01%
Acid deposition (kEq/ha-year)	Grassland	Not sensitive	2.7×10^{-5}	n/a
Airborne NOx (µg/m^3)	n/a	30	0.0051	0.02%
Airborne NH_3 (µg/m^3)	n/a	3	4.67×10^{-5}	<0.01%

2.8 Solent and Southampton Water Ramsar (UK11063) and SPA (UK9011061)

2.8.1 Ramsar background information and qualifying features

Underlying Sites of Special Scientific Interest (SSSI): Brading Marshes to St. Helen's Ledges SSSI, Eling and Bury Marshes SSSI, Hurst Castle and Lymington River Estuary SSSI, Hythe to Calshot Marshes SSSI, King's Quay Shore SSSI, Lee-on-The-Solent to Itchen Estuary SSSI, Lincegrove and Hackett's Marshes SSSI, Lower Test Valley SSSI, Lymington River Reedbeds SSSI, Medina Estuary SSSI, Newtown Harbour SSSI, North Solent SSSI, Ryde Sands and Wootton Creek SSSI, Sowley Pond SSSI, Thorness Bay SSSI, Titchfield Haven SSSI, Upper Hamble Estuary and Woods SSSI, Whitecliff Bay and Bembridge Ledges SSSI and Yar Estuary SSSI.

Qualifying and notifiable features associated with this site include:

Ramsar Criterion 1: The site is one of the few major sheltered channels between a substantial island and mainland in European waters, exhibiting an unusual strong double tidal flow and has long periods of slack water at high and low tide. It includes many wetland habitats characteristic of the biogeographic region: saline lagoons, saltmarshes, estuaries, intertidal flats, shallow coastal waters, grazing marshes, reedbeds, coastal woodland and rocky boulder reefs.

Ramsar Criterion 2: The site supports an important assemblage of rare plants and invertebrates. At least 33 British Red Data Book invertebrates and at least eight British Red Data Book plants are represented on site.

Ramsar Criterion 5: Assemblages of international importance:

Species with peak counts in winter:	
51343 waterfowl	(5 year peak mean 1998/99-2002/2003)

Ramsar Criterion 6: Species/populations occurring at levels of international importance.

Species with peak counts in spring/autumn:	
Ringed plover, *Charadrius hiaticula*, Europe/Northwest Africa	397 individuals, representing an average of 1.2% of the GB population (5 year peak mean 1998/92002/3)
Species with peak counts in winter:	
Dark-bellied brent goose, *Branta bernicla bernicla*	6456 individuals, representing an average of 3% of the population (5 year peak mean 1998/92002/3)
Eurasian teal, *Anas crecca*, NW Europe	5514 individuals, representing an average of 1.3% of the population (5 year peak mean 1998/9-2002/3)
Black-tailed godwit, *Limosa limosa islandica*, Iceland/W Europe	1240 individuals, representing an average of 3.5% of the population (5 year peak mean 1998/9-2002/3)

The Site Improvement Plan for the overlapping SPA (Solent SIP043) states that nitrogen deposition has been identified as a pressure (Natural England, 2014b). Ramsar sites do not have Site Improvement Plans.

Areas of Solent and Southampton Water (Ramsar & SPA) overlap with Solent Maritime (SAC).

2.8.2 SPA background information and qualifying features

Underlying Sites of Special Scientific Interest (SSSI): Brading Marshes to St. Helen's Ledges SSSI, Eling and Bury Marshes SSSI, Hurst Castle and Lymington River Estuary SSSI, Hythe to Calshot Marshes SSSI, King's Quay Shore SSSI, Lee-on-The-Solent to Itchen Estuary SSSI, Lincegrove and Hackett's Marshes SSSI, Lower Test Valley SSSI, Lymington River Reedbeds SSSI, Medina Estuary SSSI, Newtown Harbour SSSI, North Solent SSSI, Ryde Sands and Wootton Creek SSSI, Sowley Pond SSSI, Thorness Bay SSSI, Titchfield Haven SSSI, Upper Hamble Estuary and Woods SSSI, Whitecliff Bay and Bembridge Ledges SSSI, Yar Estuary SSSI.

The site qualifies under **Article 4.1** of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive:

During the breeding season:	
Common Tern **Sterna hirundo**	267 pairs representing at least 2.2% of the breeding population in Great Britain (5 year peak mean, 1993-1997)
Little Tern **Sterna albifrons**	49 pairs representing at least 2.0% of the breeding population in Great Britain (5 year peak mean, 1993-1997)
Mediterranean Gull **Larus melanocephalus**	2 pairs representing at least 20.0% of the breeding population in Great Britain (5 year peak mean, 1994-1998)
Roseate Tern **Sterna dougallii**	2 pairs representing at least 3.3% of the breeding population in Great Britain (5 year peak mean, 1993-1997)
Sandwich Tern **Sterna sandvicensis**	231 pairs representing at least 1.7% of the breeding population in Great Britain (5 year peak mean, 1993-1997)

The site also qualifies under **Article 4.2** of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species:

Over winter:	
Black-tailed Godwit *Limosa limosa* islandica	1,125 individuals representing at least 1.6% of the wintering Iceland - breeding population (5 year peak mean, 1992/3-1996/7)

Over winter:	
Dark-bellied Brent Goose **Branta bernicla bernicla**	7,506 individuals representing at least 2.5% of the wintering Western Siberia/Western Europe population (5 year peak mean, 1992/3-1996/7)
Ringed Plover **Charadrius hiaticula**	552 individuals representing at least 1.1% of the wintering Europe/Northern Africa - wintering population (5 year peak mean, 1992/3-1996/7)
Teal **Anas crecca**	4,400 individuals representing at least 1.1% of the wintering Northwestern Europe population (5 year peak mean, 1992/3-1996/7)

Assemblage qualification: A wetland of international importance. The area qualifies under **Article 4.2** of the Directive (79/409/EEC) by regularly supporting at least 20,000 waterfowl.

Over winter, the area regularly supports 53,948 individual waterfowl (5 year peak mean 1991/2 - 1995/6) including: Gadwall *Anas strepera*, Teal *Anas crecca,* Ringed Plover *Charadrius hiaticula*, Black-tailed Godwit *Limosa limosa islandica*, Little Grebe *Tachybaptus ruficollis*, Great Crested Grebe *Podiceps cristatus*, Cormorant *Phalacrocorax carbo*, Dark-bellied Brent Goose *Branta bernicla bernicla*, Wigeon *Anas penelope*, Redshank *Tringa totanus*, Pintail *Anas acuta*, Shoveler *Anas clypeata*, Red-breasted Merganser *Mergus serrator*, Grey Plover *Pluvialis squatarola*, Lapwing *Vanellus vanellus*, Dunlin *Calidris alpina alpina*, Curlew *Numenius arquata*, Shelduck *Tadorna tadorna*.

The Site Improvement Plan for the SPA (Solent SIP043) states that nitrogen deposition has been identified as a pressure (Natural England, 2014b).

The conservation objectives for this site are to 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.
- Areas of Solent and Southampton Water (Ramsar & SPA) overlap with Solent Maritime (SAC).

2.8.3 HRA Stage 1: Assessment of air quality impacts against screening thresholds

Table 2-16 summarizes all of the critical loads for nutrient nitrogen deposition (kgN/ha-year) and acid deposition (kEq/ha-year), as well as the critical levels for airborne ammonia (µg/m^3), applicable

to this designated site. In this table, the most stringent critical load or critical level (CL) for each pollutant is indicated in bold. The critical level for airborne NOx is set at 30 µg/m^3 across all designated sites.

Table 2-15 Minimum Critical Load and Critical Level (CL) values and associated sensitive features for Solent and Southampton Water Ramsar and SPA

Sensitive feature	Minimum nutrient nitrogen deposition CLs (kgN/ha-year)	Minimum acid deposition CLs (MinCLMaxN, kEq/ha-year)	Minimum airborne NH_3 CLs (µg/m^3)
Sterna sandvicensis (Western Europe/Western Africa) - Sandwich tern	**5**	**4.856**	**1 or 3**
Sterna dougallii (Europe - breeding) - Roseate tern	**5**	**4.856**	**1 or 3**
Sterna hirundo (Northern/Eastern Europe - breeding) - Common tern	**5**	**4.856**	**1 or 3**
Sterna albifrons (Eastern Atlantic - breeding) - Little tern	5	4.856	**1 or 3**
Branta bernicla bernicla (Western Siberia/Western Europe) - Dark-bellied brent goose	10	Not sensitive	**1 or 3**
Anas crecca (North-western Europe) - Eurasian teal	10	Not sensitive	**1 or 3**
Charadrius hiaticula (Europe/Northern Africa - wintering) - Ringed plover	10	Not sensitive	**1 or 3**
Limosa limosa islandica (Iceland - breeding) - Black-tailed godwit	10	Not sensitive	**1 or 3**
Larus melanocephalus - Mediterranean gull	10	Not sensitive	**1 or 3**

Screening results

Table 2-16 compares the maximum modelled contribution of the Havant “Plan” Scenario to the lowest applicable CL. This designated site is mainly characterized by marine habitats with short vegetation, and in these areas, the grassland deposition rates are applicable. There are also some areas of the site where taller vegetation is present and where forest deposition rates are applicable. Both grassland and forest deposition rate results are presented. This screening exercise represents a precautionary approach, as it assumes that the most sensitive qualifying features (with the lowest

CLs) are present in the areas with the highest modelled contribution (typically adjacent to the busiest road).

None of the pollutants exceeded the 1% screening threshold for the Plan Scenario. On the basis of available evidence and agreed thresholds, likely significant effects from air quality impacts can be discounted for the Havant Local Plan in isolation.

Table 2-16 Screening results based on dispersion modelling of Havant "Plan" Scenario

Pollutant	Deposition type	Minimum CL	Maximum modelled contribution	% of CL
Nutrient nitrogen deposition (kgN/ha-year)	Forest	5	3.91×10^{-5}	<0.01%
	Grassland	5	2.30×10^{-5}	<0.01%
Acid deposition (kEq/ha-year)	Forest	4.856	2.78×10^{-5}	<0.01%
	Grassland	4.856	1.64×10^{-6}	<0.01%
Airborne NOx ($\mu g/m^3$)	n/a	30	0.0001	<0.01%
Airborne NH_3 ($\mu g/m^3$)	n/a	1	2.6×10^{-6}	<0.01%

2.9 Solent Maritime SAC (UK0030059)

2.9.1 Background information and qualifying features

Underlying Sites of Special Scientific Interest (SSSI): Hythe to Calshot Marshes SSSI, Lee-on-the Solent to Itchen Estuary SSSI, Upper Hamble Estuary & Woods SSSI, Bouldnor & Hamstead Cliffs SSSI, Newtown Harbour SSSI, Bracklesham Bay SSSI, Chichester Harbour SSSI, North Solent SSSI, Lower Test Valley SSSI, Langstone Harbour SSSI, Thorness Bay SSSI, Hurst Castle & Lymington River Estuary SSSI, Yar Estuary SSSI, Medina Estuary SSSI, King's Quay Shore SSSI, Eling & Bury Marshes SSSI, Lincegrove & Hackett's Marshes SSSI.

Qualifying and notifiable features associated with this site include: **1130 Estuaries**, **1320 Spartina swards (Spartinion maritimae)**, **1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae)**, **1110 Sandbanks which are slightly covered by sea water all the time**, **1140 Mudflats and sandflats not covered by seawater at low tide**, **1150 Coastal lagoons**, **1210 Annual vegetation of drift lines**, **1220 Perennial vegetation of stony banks**, **1310 Salicornia and other annuals colonizing mud and sand**, **2120 "Shifting dunes along the shoreline with Ammophila arenaria (""white dunes"")"**, **1016 Desmoulin`s whorl snail** ***Vertigo moulinsiana***

The Site Improvement Plan for the SPA (Solent SIP043) states that nitrogen deposition has been identified as a pressure (Natural England, 2014b).

The conservation objectives for this site are to 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.
- Areas of Solent Maritime (SAC) overlap with Solent and Southampton Water (Ramsar & SPA) and Chichester and Langstone Harbours (Ramsar and SPA).

2.9.2 HRA Stage 1: Assessment of air quality impacts against screening thresholds

Table 2-17 summarizes all of the critical loads for nutrient nitrogen deposition (kgN/ha-year) and acid deposition (kEq/ha-year), as well as the critical levels for airborne ammonia (µg/m^3), applicable to this designated site. In this table, the most stringent critical load or critical level (CL) for each pollutant is indicated in bold. The critical level for airborne NOx is set at 30 µg/m^3 across all designated sites.

Table 2-17 Minimum Critical Load and Critical Level (CL) values and associated sensitive features for Solent Maritime SAC

Sensitive feature	Minimum nutrient nitrogen deposition CLs (kgN/ha-year)	Minimum acid deposition CLs (MinCLMaxN, kEq/ha-year)	Minimum airborne NH_3 CLs (µg/m^3)
Perennial vegetation of stony banks	**5**	Not sensitive	3
Shifting dunes along the shoreline with *Ammophila arenaria* ("white dunes")	10	Not sensitive	3
Fixed coastal dunes with herbaceous vegetation ("grey dunes")	**5**	**4.856**	**1**
Estuaries	10	Not sensitive	3
Coastal lagoons	10	Not sensitive	3
Salicornia and other annuals colonizing mud and sand	20	Not sensitive	3
Spartina swards (*Spartinion maritimae*)	10	Not sensitive	3
Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)	10	Not sensitive	3

Sensitive feature	Minimum nutrient nitrogen deposition CLs (kgN/ha-year)	Minimum acid deposition CLs (MinCLMaxN, kEq/ha-year)	Minimum airborne NH_3 CLs (µg/m^3)
Sandbanks which are slightly covered by sea water all the time	Not sensitive	Not sensitive	Not sensitive
Mudflats and sandflats not covered by seawater at low tide	No data	Not sensitive	3
Annual vegetation of drift lines	Not sensitive	Not sensitive	Not sensitive
Vertigo moulinsiana - Desmoulin`s whorl snail	No data	There is insufficient knowledge to make a judgment of the impacts on this species. Decision should be made at a site specific level	No data
Lutra lutra	No data	Potential negative impact on species due to impacts on the species' broad habitat.	Not sensitive
Phoca vitulina	No data	Not sensitive	Not sensitive

Screening results

Table 2-18 and compares the maximum modelled contribution of the Havant “Plan” Scenario to the lowest applicable CL. Within the Havant HRA study area, this designated site is mainly characterized by marine habitats with short vegetation and the grassland deposition rates are applicable. This screening exercise represents a precautionary approach, as it assumes that the most sensitive qualifying features (with the lowest CLs) are present in the areas with the highest modelled contribution (typically adjacent to the busiest road).

All four pollutants fall well below the 1% screening threshold for the Havant “Plan” Scenario. On the basis of available evidence and agreed thresholds, likely significant effects from air quality impacts can be ruled-out for the Plan in isolation.

Table 2-18 Screening results based on dispersion modelling of Havant “Plan” Scenario

Pollutant	Deposition type	Minimum CL	Maximum modelled contribution	% of CL
Nutrient nitrogen deposition (kgN/ha-year)	Grassland	5	0.0033	0.07
Acid deposition (kEq/ha-year)	Grassland	4.856	0.0002	<0.01%
Airborne NOx (µg/m^3)	n/a	30	0.046	0.15%
Airborne NH_3 (µg/m^3)	n/a	1	4.2×10^{-5}	<0.01%

3. Consideration of in combination effects

3.1 Approach to in combination assessment

Guidance from Natural England (Natural England, 2018) developed following the requirements of the Wealden Judgment, advises that the screening thresholds should be applied with consideration to impacts from individual proposed developments and with consideration to in combination effects. Guidance for local authorities advises that "*The [in combination] assessment should calculate the effects of all proposals combined on relevant critical loads and levels on the protected site. You should use the details in planning portals and the permitting register to check that these calculations are accurate. If the air pollution caused by all proposals at the protected site combined is above 1% of any critical load or level, continue to step 5 [completing a detailed air quality assessment]*" (Natural England, 2025).

HRA studies from neighbouring local authorities were searched; in addition to the National Infrastructure Planning website to identify any potentially relevant major developments within the study area (National Infrastructure Planning Inspectorate, 2026).

Individual maximum process contributions for each habitat site were obtained from HRA studies from neighbouring local authorities, from data presented either in the main body of the report, or from the Appendices. In some cases, the process contribution was not specifically reported (for Chichester and Portsmouth, so was calculated by subtracting the future Do Something scenario (with local plan allocations) from the future scenario without local plan allocations.

Individual maximum process contributions were then summed across all local plans to calculate an in combination total nitrogen deposition, acid deposition, airborne NOx concentration and airborne NH_3 concentration. The sum total maximum process contribution represents a conservative approach to estimating the in combination air quality effects of all development – in reality, the maximum in isolation process contributions from each development may not be in the same location within habitat sites.

A proposal, alone or in combination with other proposals, could cause a significant effect on a European site if there is:

- a reduction in the amount or quality of designated habitats or the habitats that support designated species
- a limit to the potential for restoring designated habitats in the future
- a significant disturbance to the designated species
- disruption to the natural processes that support the site's designated features
- only reduction or offset measures in place.

The NOx pollutant background maps (Defra, 2024) used in the air dispersion model account for existing industrial activity, including large combustion installations, airports and shipping activity. Known industrial sources are modelled explicitly in the baseline year of the background maps, and future-year background maps are derived by incorporating datasets from the UK Department for Business, Energy & Industrial Strategy (BEIS) regarding projected energy and economic activity data for various industrial sectors. The background maps therefore account for future growth in industrial sector emissions, within the limits of current government growth projections.

3.2 Planned development in adjacent authorities

The borough of Havant shares its borders with Chichester, East Hampshire, Fareham, Portsmouth and Winchester. Isle of Wight and Gosport were also identified as local authorities with the potential to impact on the habitats included in the Havant study area. HRA studies from these neighbouring authorities were searched in order to extract relevant information concerning other sources of in combination effects. The results of this exercise are summarised in section 3.4.

Table 3-1 Summary of conclusions on air pollution and air quality impacts from relevant Local Plan HRAs

Authority	Local Plan HRA conclusions
Chichester District Council	The Chichester Local Plan Habitats Regulation Assessment (AECOM, 2023) concludes that "*Since the NOx concentrations and nitrogen critical load for the relevant roadside habitats in 2040 are not forecast to be exceeded,* ***no adverse effect on the integrity of the coastal European sites will arise, either alone or in combination with other plans and projects***." The "Chichester Local Plan Main Modifications Habitat Regulations Assessment March 2025" (AECOM, 2025) provides an updated air quality impact assessment and subsequent Modifications to Chichester Local Plan, following concerns flagged by Natural England regarding ammonia at The Mens SAC – a habitat site which is outside of the 10km area surrounding Havant, and therefore out of scope for in combination effects for the Havant "Plan".
East Hampshire Borough Council	East Hampshire Local Plan Habitats Regulations Assessment Regulation 18 (AECOM, 2024), concludes that "The increase in residential and employment development in EHD will lead to an increase in commuter traffic within the district and to neighbouring authorities. Depending on the route taken by individual residents, this is likely to lead to an increase in flows within 200m of sensitive designated habitats. Based on a preliminary analysis of road infrastructure and existing commuter trends, this HRA has identified that LSEs on the Butser Hill SAC (and other habitat sites which are not included in this Havant study) regarding atmospheric pollution cannot be excluded. The AA for this impact

Authority	Local Plan HRA conclusions
	pathway will encompass traffic and air quality modelling to identify effects on air quality, in-combination with other plans and projects." However, at the time of conducting this in combination assessment, such an AA with air quality modelling results is not yet available. It will therefore be incumbent on East Hampshire Borough Council to include Havant Local Plan in any in-combination assessment that it should carry out in the future.
Fareham Borough Council	Fareham Borough Council's Air Quality Habitats Regulations Assessment for the Fareham Borough Local Plan 2021-2037 (Ricardo Energy & Environment, 2020) includes an in combination air quality modelling scenario for the Partnership for South Hampshire (PfSH) sub-region, based on an in combination traffic model scenario using the SRTM encompassing all development and traffic growth across the PfSH sub-region committed up to 2036 at the time of that modelling study (2018-2019). It carries out Appropriate Assessment for the Portsmouth Harbour Ramsar and SPA, Solent and Dorset Coast SPA, Solent and Southampton Water Ramsar and SPA and the Solent Maritime SAC. For these four habitat sites, following Appropriate Assessment, adverse effects (pre-mitigation) could be discounted for all qualifying features of the site, and for nitrogen deposition, acid deposition, oxides of nitrogen (NOx) and ammonia (NH_3) as causal pollutants. The HRA Air Quality Assessment concludes that for all habitat sites, on the basis of available evidence, "*adverse effects can be discounted and as such there will be no threat to the ability of the European site to achieve its conservation objectives or maintain its integrity as a result of the FBLP, in combination with development in other local authorities within the PfSH sub-region*".
Gosport Borough Council	The HRA Screening and Appropriate Assessment screens out likely significant effects from atmospheric pollution to all European sites including Solent & Isle of Wight Lagoons SAC, Solent Maritime SAC, Chichester & Langstone Harbour, Portsmouth Harbour SPA and Ramsar, Solent & Dorset Coast SPA and Solent & Southampton Water SPA and Ramsar (Urban Edge Consulting Ltd, 2026). Screening was based on the "200m from edge of road affected by a plan or project" threshold from Natural England (2018) and predicted changes in AADT by more than 1,000 AADT. The Gosport HRA Screening and Appropriate Assessment concludes that "*the Regulation 19 Publication Local Plan is unlikely to significantly affect European sites within the scope of this assessment as a result of atmospheric pollution alone and in*

Authority	Local Plan HRA conclusions
	combination", evidenced by the Fareham Borough Local Plan 2037 in combination modelling assessment (Ricardo, 2020), with the following main points: • The 2020 Fareham HRA Appropriate Assessment found that the affected feature was not sensitive to the pollutant being assessed, the qualifying feature was unlikely to be present in the effected location, and the affected locations were regularly inundated with tidal water preventing accumulation of any deposited pollutants. • The 2020 in combination modelling presents an over-precautionary in combination assessment due to the provision for number of dwellings proposed in the Fareham Local Plan has since reduced. • Since the 2020 Fareham Local Plan in combination assessment the threshold nitrogen deposition critical load for the qualifying tern species of the Solent & Southampton SPA/Ramsar has been lowered from 8 kgN/ha/yr to 5 kgN/ha/yr.
Isle of Wight Council	The 2022 IPS Habitats Regulations Assessment HRA Report (LUC, 2022) screens out potential likely significant effects from air pollution to the following habitats relevant to the Havant study: Solent Maritime SAC, Solent and Southampton Water SPA and Ramsar and Solent and Dorset Coast SPA. The justification for screening these out is based on the Air Quality Assessment undertaken by Ricardo in 2019 for Fareham Borough Council – the PfSH in combination modelling scenario which considered a higher level of growth from Isle of Wight than the level of growth proposed in the current Local Plan. The findings of the assessment identified that likely significant effects from air quality can be ruled out in relation to Solent Maritime SAC, Solent and Dorset Coast SPA and Solent & Southampton Water SPA.
Portsmouth City Council	The Habitat Regulations Assessment of the Portsmouth Local Plan (AECOM, 2026) Appropriate Assessment of atmospheric pollution highlighted that areas of saltmarsh are the only habitat that could be subjected to increased nitrogen deposition as a result of two-way commuter traffic associated with the PLP. Areas of saltmarsh within the following Habitats sites lie within 200m of likely commuter routes for Portsmouth City residents:

Authority	Local Plan HRA conclusions
	• Approx. 164m from the A32 in the Portsmouth Harbour SPA / Ramsar • Approx. 36m from the A27 / A3 interchange in the Chichester and Langstone Harbours SPA / Ramsar • Adjacent to the A2030 in the eastern part of Portsmouth City in the Solent Maritime SAC (this habitat was initially identified as 'perennial vegetation of stony banks' but later confirmed to comprise a saltmarsh community) Additionally, "*The air quality assessment undertaken for this HRA identifies no air quality sensitive habitat within Portsmouth Harbour SPA/Ramsar site is located within 200m of affected roads. It concludes that for Chichester & Langstone Harbours SPA/Ramsar site traffic growth is associated with growth across southern England, given the regionally strategic nature of the A27 as one of the busiest trunk roads in the UK, rather than by local growth, and that the forecast effect of the Portsmouth Local Plan is insignificant (slowing the forecast rate of improvement in nitrogen deposition by less than a year). For Solent Maritime SAC the same conclusion is drawn, Moreover, one of the key affected areas of saltmarsh is to be directly affected by the NPI Phase 4 Coastal Defence Project and suitable compensatory provision of saltmarsh is to be agreed and delivered for that independent scheme.*" Overall, "*With the amendments recommended above and now included in the Local Plan, it has been possible to conclude that* ***no elements of Portsmouth Local Plan will have an adverse effect on the integrity of any Habitats sites, either alone or in combination with other plans or projects***."
Winchester City Council	The HRA screens out impacts to habitats included in the Havant study area based on distance (LUC, 2024). Increased traffic from planned developments associated with Winchester Local Plan is not expected to contribute to any significant effects on the sensitive habitat sites within 10km of Havant, and **in combination impacts can be ruled out.**

For the Local Plan HRAs which conducted air quality modelling for local plan contributions towards habitats within 10km of Havant Borough Council (specifically Chichester, Fareham and Portsmouth), in combination air quality modelling is presented below.

3.3 National infrastructure projects

A search of the National Infrastructure Planning website was carried out to identify national infrastructure projects located within 10 km of the Havant Borough Council boundary which could potentially have an in-combination impact with the Havant Local Plan. One such project was identified: the AQUIND Interconnector.

AQUIND Interconnector

Propsals for a new High Voltage Direct Current marine and underground electric power transmission link between the Lovedean in Hampshire, England and Normandy, France (National Infrastructure Planning Inspectorate, 2025).

The Habitats Regulations Assessment Report (AQUIND Limited, 2020) screened 20 designated habitats sites in total for likely significant effects as a result of the construction operation and decomissioning of the proposed development, in isolation and in combination with other projects and plans. Effects considered included:

- Disturbance and displacement, indirect effects, and accidental spills and litter on ornithological features;
- Pollution on Annex I habitats, migratory fish and marine mammal features;
- Invasive species, sediment deposition, and increased suspended sediments on Annex I habitats; and
- Increased suspended sediments on migratory fish features.

For the sites and features assessed, it was has been concluded that the Proposed Development will not have an adverse effect on site integrity alone or in combination with other projects and plans. No further detail is provided within the HRA on air quality effects.

Additionally, Chapter 16 “Onshore Ecology” of the Environmental Statement for the AQUIND Interconnector EIA concludes that “effects of air pollution will be of a negligible magnitude, with negligible effects that are not significant” (AQUIND Limited, 2019).

Hampshire Water Transfer and Water Recycling Project

This project was entered on the National Infrastructure Planning Website on 25th June 2026 (National Infrastructure Planning Inspectorate, 2026), following completion of the in combination assessment. As such, an evaluation of this project is provided in this section, but is not incorporated into section 3.4.

The project comprises the construction, operation and maintenance of a Water Recycling Plant and associated infrastructure. The Environmental Statement Chapter 6 on Air Quality and Odour (Southern Water, 2026) assesses the impacts on air quality of the construction phase:

- Chichester and Langstone Harbours Ramsar are predicted to be below 1% of the lower nitrogen deposition Critical Load with the Proposed Development alone and cumulatively.
- Total nitrogen deposition rates (including background) for both the Proposed Development alone and cumulatively are in exceedance of the lower Critical Load at Chichester and Langstone Harbours Ramsar, for all modelled transect points. It should be noted that background nutrient nitrogen deposition rates already exceed the lower Critical Loads at all assessed ecological features.

The Environmental Statement Chapter 6 on Air Quality and Odour also assesses cumulative effect from non-road sources with proposed APP/24/00237 National Grid Back-up Gas Fuelled Generation Plant, which concludes that:

- "With the addition of the NOx contribution from the National Grid Back-up Gas Fuelled Generation Plant to the contribution of the Proposed Development and cumulative traffic, the cumulative contributions are predicted to be above 1% of the Critical Level at the Chichester and Langstone Harbours Ramsar and SPA/Solent Maritime SAC/Langstone Harbour SSSI. However, total cumulative NOx concentrations are predicted to be well below (i.e. less than 75% of) the Critical Level at all modelled receptors."
- "The cumulative nutrient nitrogen deposition contributions are predicted to exceed 1% of both the relevant upper and lower Critical Loads at the Chichester and Langstone Harbours Ramsar and SPA/Solent Maritime SAC/Langstone Harbour SSSI. The total cumulative contributions are predicted to exceed the most stringent nutrient nitrogen deposition Critical Load, however these remained below the least stringent Critical Load at this designated ecological feature. It should be noted that background nutrient nitrogen deposition already exceeds the lower Critical Load at the Chichester and Langstone Harbours Ramsar and SPA/Solent Maritime SAC/Langstone Harbour SSSI."

The construction phase is expected to start in 2029 and the operational phase is expected to start in 2034. Operational phase impacts from the Proposed Development have been scoped out of the assessment, as agreed in the EIA Scoping Opinion.

In view of the minimal contribution of the Havant local plan (maximum 0.17% of the CL at Chichester and Langstone Harbours Ramsar and SPA; and maximum 0.07% of the CL at Solent Maritime SAC), any in-combination effects would be dominated by the Hampshire Water Transfer and Water Recycling Project. In this context, reductions in the Havant contribution, even if substantial in relative terms, would not result in a meaningful change in the integrity outcome for the site. Responsibility for addressing the in combination effect lies with those projects and plans that constitute the dominant share of the impact.

3.4 Summary of in combination effects

3.4.1 In combination effects on Butser Hill SAC (UK0030103)

Butser Hill SAC has been screened in for potential air quality effects by the Chichester Local Plan and additionally East Hampshire, though Appropriate Assessment is still pending for East Hampshire.

Table 3-2 and Table 3-3 show that in combination total from Havant and Chichester local plans exceeds 1% of the critical load for nutrient nitrogen deposition (167%), airborne NOx concentrations (3.8%) and airborne NH_3 concentrations (1.0%). Acid deposition is not reported for Chichester local plan, so it is not possible to report an in combination total for acid deposition (acid deposition was less significant than nitrogen deposition for the Havant Borough Council plan in isolation, so this is not expected to be a significant omission). It can be seen from Table 3-2 that the contribution from

Chichester Local Plan is already in exceedance of the minimum critical level for nutrient nitrogen deposition.

Table 3-3 breaks down the contribution of each local plan as a percentage of the in combination total. The Havant contribution comprises <2% of the in combination total for each exceeding pollutant, and the Chichester local plan contributions comprises >98.0% of the in combination total for each exceeding pollutant. For the impact of greatest concern (nitrogen deposition), the Havant contribution is less than 0.1% of the in-combination total. Again, results from East Hampshire are not yet available, pending air quality modelling within their Appropriate Assessment.

It can be concluded that whilst there is an in combination risk for nitrogen deposition, airborne NOx and airborne NH_3 impacts to Butser Hill, the contribution from the Havant Local Plan is extremely small in the context of the wider impact. The scale of influence for the Havant Local Plan is negligible compared with other plans and projects forming the large majority of the potential effect on Butser Hill SAC. In this context, reductions in the Havant contribution, even if substantial in relative terms, would not result in a meaningful change in the integrity outcome for the site. Responsibility for addressing the wider effect lies with those plans that constitute the dominant share of the impact.

Table 3-2 In combination assessment for Butser Hill SAC (East Hampshire Appropriate Assessment pending): Maximum modelled contributions to habitats from local plans

Pollutant	Deposition type	Minimum CL	Maximum modelled contribution			
			Havant	Chichester	In comb total	In comb total % of CL
Nutrient nitrogen deposition (kgN/ha-year)	Forest	**5**	0.003	8.4*	**8. 4**	**167.3%**
	Grassland	**5**	0.002	8.4*	**8.4**	**167.2%**
Acid deposition (kEq/ha-year)	Forest	**1.059**	0.0002	n/a	**n/a**	**<0.1%**
	Grassland	**1.059**	0.0001	n/a	**n/a**	**<0.1%**
Airborne NOx ($\mu g/m^3$)	n/a	**30**	0.02	1.1	**1.1**	**3.8%**
Airborne NH_3 ($\mu g/m^3$)	n/a	**1**	0.000026	0.01	**0.01**	**1.0%**

*It is unclear which deposition velocity was used by the Chichester local plan to calculate nutrient nitrogen deposition for this site

Table 3-3 In combination assessment for Butser Hill SAC (East Hampshire Appropriate Assessment pending): Percentage contributions

Pollutant	Deposition type	Minimum CL	In comb total % of CL	LP % contributions to In comb total	
				Havant	Chichester
Nutrient nitrogen deposition (kgN/ha-year)	Forest	**5**	**167.3%**	<0.1%	>99.9%
	Grassland	**5**	**167.2%**	<0.1%	>99.9%
Acid deposition (kEq/ha-year)	Forest	**1.059**	**<0.1%**	100%	n/a
	Grassland	**1.059**	**<0.1%**	100%	n/a
Airborne NOx ($\mu g/m^3$)	n/a	**30**	**3.8%**	2.0%	98.0%
Airborne NH_3 ($\mu g/m^3$)	n/a	**1**	**1.0%**	0.3%	99.7%

3.4.2 In combination effects on Chichester and Langstone Harbours Ramsar (UK11013) and SPA (UK9011011)

Chichester and Langstone Harbours Ramsar and SPA has been screened in for potential air quality effects by the Chichester, Fareham and Portsmouth City local plan HRAs. Table 3-4 and Table 3-5 show that the in combination total from Havant and these local plans exceeds 1% of the CL for nutrient nitrogen deposition (39.6%), airborne NOx concentrations (8.1%) and airborne NH_3 concentrations (15%). The in combination contribution to acid deposition is 0.01% of the CL, however acid deposition is not reported for Chichester or Portsmouth City local plan HRAs.

Table 3-5 shows that contributions from Chichester and Portsmouth City local plans to the pollutants exceeding the CL comprise the majority (>97.5%) of the in combination total. For the impact of greatest concern (nitrogen deposition), the Havant contribution is less than 0.5% of the in-combination total.

It can be concluded that whilst there is an in combination risk for nitrogen deposition, airborne NOx and airborne NH_3 impacts to Chichester and Langstone Harbours Ramsar and SPA, the contribution from the Havant Local Plan is small in the context of the wider impact. The scale of influence for the Havant Local Plan is negligible compared with other plans and projects forming the large majority of the potential effect on the habitat site. In this context, reductions in the Havant contribution, even if substantial in relative terms, would not result in a meaningful change in the integrity outcome for the site. Responsibility for addressing the in combination effect lies with those plans that constitute the dominant share of the impact.

Table 3-4 In combination assessment for Chichester and Langstone Harbours Ramsar and SPA: Maximum modelled contributions to habitats from local plans

Pollutant	Deposition type	Min CL	Maximum modelled contribution					
			Havant	Chichester	Fareham	Portsmouth City	In Comb total	In comb total % of CL
Nutrient nitrogen deposition (kgN/ha-year)	Forest	**5**	0.008	1.5*	<0.00001	0.5*	**2.0**	**39.6%**
	Grassland	**5**	0.004	1.5*	<0.00001	0.5*	**2.0**	**39.5%**
Acid deposition (kEq/ha-year)	Forest	**4.856**	0.0006	n/a	<0.00001	n/a	**<0.1**	**<0.1%**
	Grassland	**4.856**	0.0003	n/a	<0.00001	n/a	**<0.1**	**<0.1%**
Airborne NOx ($\mu g/m^3$)	n/a	**30**	0.06	0.9	<0.00001	1.5	**2.4**	**8.07%**
Airborne NH_3 ($\mu g/m^3$)	n/a	**1**	0.00004	0.08	<0.00001	0.1	**0.2**	**15.00%**

*It is unclear which deposition velocity was used by the Chichester or Portsmouth City local plans to calculate nutrient nitrogen deposition for this site

Table 3-5 In combination assessment for Chichester and Langstone Harbours Ramsar and SPA: Percentage contributions

Pollutant	Deposition type	Min CL	In comb total % of CL	LP % contributions to in comb total			
				Havant	Chichester	Fareham	Portsmouth City
Nutrient nitrogen deposition (kgN/ha-year)	Forest	**5**	**39.6%**	0.4%	76.8%	<0.1%	22.7%
	Grassland	**5**	**39.5%**	0.2%	77.0%	<0.1%	22.8%
Acid deposition (kEq/ha-year)	Forest	**4.856**	**<0.1%**	>99.9%	n/a	<0.1%	n/a
	Grassland	**4.856**	**<0.1%**	>99.9%	n/a	<0.1%	n/a
Airborne NOx ($\mu g/m^3$)	n/a	**30**	**8.1%**	2.5%	35.1%	<0.1%	62.4%

Pollutant	Deposition type	Min CL	In comb total % of CL	LP % contributions to in comb total			
				Havant	Chichester	Fareham	Portsmouth City
Airborne NH_3 ($\mu g/m^3$)	n/a	**1**	**15.0%**	<0.1%	53.3%	<0.1%	46.7%

3.4.3 In combination effects on Kingley Vale SAC

Table 3-6 and Table 3-7 present in combination results for Kingley Vale SAC, which is screened into the Chichester local plan HRA. The in combination total exceeds 1% of the CL for nutrient nitrogen deposition (3.8%), but is below 1% for airborne NOx and NH_3 concentrations. Acid deposition results are not reported in the Chichester local plan HRA.

Table 3-7 shows that contributions from Chichester local plan comprise the majority (99.8-99.9%) of the in combination total for nutrient nitrogen deposition.

It can be concluded that whilst there is an in combination risk for nitrogen deposition impacts to Kingley Vale, the contribution from the Havant Local Plan is extremely small in the context of the wider impact. The scale of influence for the Havant Local Plan is negligible relevant to other plans and projects forming the large majority of the potential effect on Kingley Vale SAC. In this context, reductions in the Havant nitrogen deposition contribution, even if substantial in relative terms, would not result in a meaningful change in the integrity outcome for the site. Responsibility for addressing the wider effect principally lies with those plans that constitute the dominant share of the impact.

Table 3-6 In combination assessment for Kingley Vale SAC: Maximum modelled contributions to habitats from local plans

Pollutant	Deposition type	Minimum CL	Maximum modelled contribution			
			Havant	Chichester	In comb total	In comb total % of CL
Nutrient nitrogen deposition (kgN/ha-year)	Forest	**5**	0.00003	0.2*	**0.2**	**3.8%**
	Grassland	**5**	0.00002	0.2 *	**0.2**	**3.8%**
Acid deposition (kEq/ha-year)	Forest	**4.856**	<0.00001	n/a	**<0.1**	**<0.1%**
	Grassland	**4.856**	<0.00001	n/a	**<0.1**	**<0.1%**
Airborne NOx ($\mu g/m^3$)	n/a	**30**	0.0002	0.03	**<0.1**	**0.1%**
Airborne NH_3 ($\mu g/m^3$)	n/a	**1**	<0.00001	<0.01	**<0.1**	**<0.1%**

*It is unclear which deposition velocity was used by the Chichester local plan to calculate nutrient nitrogen deposition for this site

Table 3-7 In combination assessment for Kingley Vale SAC: Percentage contributions

Pollutant	Deposition type	Minimum CL	In comb total % of CL	LP % contribution to In comb total	
				Havant	Havant
Nutrient nitrogen deposition (kgN/ha-year)	Forest	**5**	**3.8%**	<0.1%	>99.9%
	Grassland	**5**	**3.8%**	<0.1%	>99.9%
Acid deposition (kEq/ha-year)	Forest	**4.856**	**<0.1%**	100.0%	n/a
	Grassland	**4.856**	**<0.1%**	100.0%	n/a
Airborne NOx ($\mu g/m^3$)	n/a	**30**	**0.1%**	0.6%	99.4%
Airborne NH_3 ($\mu g/m^3$)	n/a	**1**	**<0.1%**	>99.9%	<0.1%

3.4.4 In combination effects on Pagham Harbour Ramsar (UK11052) and SPA (UK9012041)

Table 3-8 and Table 3-9 present in combination results for Pagham Harbour Ramsar and SAC, which is screened into the Chichester local plan HRA. Portsmouth City Local Plan HRA screens out this habitat site due to no pathway between the site and source locations.

The in combination total exceeds 1% of the CL for nutrient nitrogen deposition (69.2%), airborne NOx concentrations (5.2%) and airborne NH_3 concentrations (15.0%). Acid deposition results are not reported in the Chichester local plan HRA.

Table 3-9 shows that contributions from Chichester local plan comprise the large majority (99.8-99.9%) of the in combination total for nutrient nitrogen deposition.

It can be concluded that whilst there is an in combination risk for nitrogen deposition, airborne NOx and airborne NH_3 impacts to Pagham Harbour Ramsar and SPA, the contribution from the Havant Local Plan is extremely small in the context of the wider impact. The scale of influence for the Havant Local Plan is negligible relevant to other plans and projects forming the large majority of the potential effect on Pagham Harbour Ramsar and SPA. In this context, reductions in the Havant contribution, even if substantial in relative terms, would not result in a meaningful change in the integrity outcome for the site. Responsibility for addressing the in combination effect principally lies with those plans that constitute the dominant share of the impact.

Table 3-8 In combination assessment for Pagham Harbour Ramsar and SPA: Maximum modelled contributions to habitats from local plans

Pollutant	Deposition type	Minimum CL	Maximum modelled contribution			
			Havant	Chichester	In comb total	In comb total % of CL
Nutrient nitrogen deposition (kgN/ha-year)	Forest	**5**	<0.00001	3.5*	**3.5**	**69.2%**
	Grassland	**5**	<0.00001	3.5*	**3.5**	**69.2%**
Acid deposition (kEq/ha-year)	Forest	**4.856**	<0.00001	n/a	**<0.1**	**<0.1%**
	Grassland	**4.856**	<0.00001	n/a	**<0.1**	**<0.1%**
Airborne NOx (µg/m^3)	n/a	**30**	<0.00001	1.6	**1.6**	**5.2%**
Airborne NH_3 (µg/m^3)	n/a	**1**	<0.00001	0.2	**0.2**	**15.0%**

*It is unclear which deposition velocity was used by the Chichester local plan to calculate nutrient nitrogen deposition for this site

Table 3-9 In combination assessment for Pagham Harbour Ramsar and SPA: Percentage contributions

Pollutant	Deposition type	Minimum CL	In comb total % of CL	LP % contribution to In comb total	
				Havant	Chichester
Nutrient nitrogen deposition (kgN/ha-year)	Forest	**5**	**69.2%**	<0.1%	>99.9%
	Grassland	**5**	**69.2%**	<0.1%	>99.9%
Acid deposition (kEq/ha-year)	Forest	**4.856**	**<0.1%**	100.00%	n/a
	Grassland	**4.856**	**<0.1%**	100.00%	n/a
Airborne NOx (µg/m^3)	n/a	**30**	**<0.1%**	<0.1%	>99.9%
Airborne NH_3 (µg/m^3)	n/a	**1**	**5.2%**	<0.1%	>99.9%

3.4.5 In combination effects on Portsmouth Harbour Ramsar and SPA

Portsmouth Harbour Ramsar and SPA has been screened in for potential air quality effects by the Chichester, Fareham and Portsmouth City local plan HRAs. It can be concluded that whilst there is an in combination risk for nitrogen deposition, airborne NOx and airborne NH_3 impacts to

Portsmouth Harbour Ramsar and SPA, the contribution from the Havant Local Plan is small in the context of the wider impact. The scale of influence for the Havant Local Plan is negligible relevant to other plans and projects forming the large majority of the potential effect on the habitat site. In this context, reductions in the Havant contribution, even if substantial in relative terms, would not result in a meaningful change in the integrity outcome for the site. Responsibility for addressing the in combination effect lies with those plans that constitute the dominant share of the impact.

Table 3-10 and Table 3-11Table 3-4 show that the in combination total from Havant and these local plans exceeds 1% of the CL for nutrient nitrogen deposition (24.7%), airborne NOx concentrations (6.6%) and airborne NH_3 concentrations (8.2%). This habitat is not sensitive to acid deposition.

Table 3-11shows that contributions from Chichester, Fareham and Portsmouth City local comprise the majority of the in combination total of the pollutants exceeding the CL, where Havant contributes 2.2% or less. For the impact of greatest concern (nitrogen deposition), the Havant contribution is 0.1% of the in-combination total.

It can be concluded that whilst there is an in combination risk for nitrogen deposition, airborne NOx and airborne NH_3 impacts to Portsmouth Harbour Ramsar and SPA, the contribution from the Havant Local Plan is small in the context of the wider impact. The scale of influence for the Havant Local Plan is negligible relevant to other plans and projects forming the large majority of the potential effect on the habitat site. In this context, reductions in the Havant contribution, even if substantial in relative terms, would not result in a meaningful change in the integrity outcome for the site. Responsibility for addressing the in combination effect lies with those plans that constitute the dominant share of the impact.

Table 3-10 In combination assessment for Portsmouth Harbour Ramsar and SPA: Maximum modelled contributions to habitats from local plans

Pollutant	Deposition type	Min CL	Maximum modelled contribution					
			Havant	Chichester	Fareham	Portsmouth City	In comb total	In comb total % of CL
Nutrient nitrogen deposition (kgN/ha-year)	Grassland	**10**	0.003	1.09	0.1	1.3	**2.5**	**24.7%**
Acid deposition (kEq/ha-year)	Grassland	**Not sensitive**	n/a	n/a	n/a	n/a	**n/a**	**n/a**
Airborne NOx (µg/m^3)	n/a	**30**	0.04	0.19	0.8	0.9	**2.0**	**6.6%**

Airborne NH_3 ($\mu g/m^3$)	n/a	**1**	0.00002	0.00	0.02	0.2	**0.2**	**8.2%**

Table 3-11 In combination assessment for Portsmouth Harbour Ramsar and SPA: percentage contributions: Percentage contributions

Pollutant	Deposition type	Min CL	In comb total % of CL	LP % contribution to In comb total			
				Havant	Chichester	Fareham	Portsmouth City
Nutrient nitrogen deposition (kgN/ha-year)	Grassland	**10**	**24.7%**	0.1%	44.2%	4.9%	50.7%
Acid deposition (kEq/ha-year)	Grassland	**Not sensitive**	**n/a**	n/a	n/a	n/a	n/a
Airborne NOx ($\mu g/m^3$)	n/a	**30**	**6.6%**	2.2%	9.5%	41.0%	47.2%
Airborne NH_3 ($\mu g/m^3$)	n/a	**3**	**8.2%**	<0.1%	<0.1%	6.7%	93.3%

3.4.6 In combination effects on Solent and Dorset Coast SPA (UK9020330)

Solent and Dorset Coast SPA has been screened in for potential air quality effects by the Chichester and Fareham local plan HRAs. Table 3-12 and Table 3-13Table 3-4 show that the in combination total from Havant and these local plans exceeds 1% of the CL for nutrient nitrogen deposition (29.8%), airborne NOx concentrations (5.0%) and airborne NH_3 concentrations (2.1%). This habitat is not sensitive to acid deposition.

Table 3-13Table 3-4 shows that contributions from Chichester and Fareham local plans comprise the majority of the in combination total of the pollutants exceeding the CL, whilst contributions from Havant comprise 3.8% or less. For the impact of greatest concern (nitrogen deposition), the Havant contribution is 0.3% of the in-combination total.

It can be concluded that whilst there is an in combination risk for air pollution impacts to Solent and Dorset Coast SPA, the contribution from the Havant Local Plan is extremely small in the context of the wider impact. The scale of influence for the Havant Local Plan is negligible relevant to other plans and projects forming the large majority of the potential effect on this habitat site. In this context, reductions in the Havant contribution, even if substantial in relative terms, would not result in a meaningful change in the integrity outcome for the site. Responsibility for addressing the wider effect principally lies with those plans that constitute the dominant share of the impact.

Table 3-12 In combination assessment for Solent and Dorset Coast SPA: maximum modelled contributions to habitats from local plans (

Pollutant	Deposition type	Minimum CL	Maximum modelled contribution				
			Havant	Chichester	Fareham	In comb total	In comb total % of CL
Nutrient nitrogen deposition (kgN/ha-year)	Grassland	**5**	0.004	1.1	0.4	**1.5**	**29.8%**
Acid deposition (kEq/ha-year)	Grassland	**4.856**	0.0003	n/a	0.03	**<0.01**	**0.6%**
Airborne NOx (µg/m^3)	n/a	**30**	0.1	0.2	1.3	**1.5**	**5.0%**
Airborne NH_3 (µg/m^3)	n/a	**3**	0.0001	<0.1	0.1	**0.1**	**2.1%**

Table 3-13 In combination assessment for Solent and Dorset Coast SPA, percentage contributions

Pollutant	Deposition type	Min CL	In comb total % of CL	LP % contribution to in comb total		
				Havant	Chichester	Fareham
Nutrient nitrogen deposition (kgN/ha-year)	Grassland	**5**	**29.8%**	0.3%	73.1%	26.6%
Acid deposition (kEq/ha-year)	Grassland	**4.856**	**0.6%**	1.0%	<0.1%	99.0%
Airborne NOx (µg/m^3)	n/a	**30**	**5.0%**	3.8%	12.7%	83.5%
Airborne NH_3 (µg/m^3)	n/a	**3**	**2.1%**	0.1%	0.0%	99.9%

3.4.7 In combination effects on Solent and Isle of Wight Lagoons SAC (UK0017073)

Solent and Isle of Wight Lagoons SAC has been screened in for potential air quality effects by the Fareham local plan HRA. Chichester local plan HRA screens out this habitat site on the basis of “no identifiable pathway linking development in the Local Plan area” to the site. Table 3-14Table 3-4 shows that the in combination total is less than 1% of the CL for nutrient nitrogen deposition, airborne NOx concentrations and airborne NH_3 concentrations. This habitat is not sensitive to acid deposition.

Table 3-14 In combination assessment for Solent and Dorset Coast SPA: maximum modelled contributions to habitats from local plans

Pollutant	Deposition type	Minimum CL	Maximum modelled contribution			
			Havant	Fareham	In comb total	In comb total % of CL
Nutrient nitrogen deposition (kgN/ha-year)	Grassland	**10**	0.0004	0.000001	**<0.1**	**<0.1%**
Acid deposition (kEq/ha-year)	Grassland	**Not sensitive**	n/a	n/a	**n/a**	**n/a**
Airborne NOx (µg/m^3)	n/a	**30**	0.005	0.000001	**<0.1**	**<0.1%**
Airborne NH_3 (µg/m^3)	n/a	**3**	0.000005	0.000000	**<0.1**	**<0.1%**

3.4.8 In combination effects on Solent and Southampton Water Ramsar (UK11063) and SPA (UK9011061)

Solent and Southampton Water Ramsar and SPA has been screened in for potential air quality effects by the Fareham local plan HRA. Table 3-15Table 3-4 shows that the in combination total is less than 1% of the CL for nutrient nitrogen deposition, airborne NOx concentrations and airborne NH_3 concentrations.

Table 3-15 In combination assessment for Solent and Southampton Water Ramsar and SPA: maximum modelled contributions to habitats from local plans

Pollutant	Deposition type	Minimum CL	Maximum modelled contribution			
			Havant	Fareham	In comb total	In comb total % of CL
Nutrient nitrogen deposition (kgN/ha-year)	Forest	**5**	0.000039	n/a	**<0.1**	**<0.1%**
	Grassland	**5**	0.000023	0.0274	**<0.1**	**0.5%**
Acid deposition (kEq/ha-year)	Forest	**4.856**	0.000003	n/a	**<0.1**	**<0.1%**
	Grassland	**4.856**	0.000002	0.00195	**<0.1**	**<0.1%**
Airborne NOx (µg/m^3)	n/a	**30**	0.000134	0.0662	**0.1**	**0.2%**

Airborne NH_3 ($\mu g/m^3$)	n/a	**1**	0.000003	0.00438	**<0.1**	**0.4%**

3.4.9 In combination effects on Solent Maritime SAC (UK0030059)

Table 3-16 and Table 3-17 present the in combination results for Solent Maritime SAC, which is screened into the Chichester local plan HRA. Porsmouth City Local Plan HRA screens in this habitat but does not conduct any in insolation modelling for it. Portsmouth City Local Plan HRA instead draws conclusions from the Fareham 2019 in combination PfSH modelling, concluding unlikely significant effects to Solent Maritime SAC in combination.

The Havant and Chichester local plans in combination total exceeds 1% of the CL for nutrient nitrogen deposition (30.5%), airborne NOx concentrations (3.0%) and airborne NH_3 concentrations (8.0%). Acid deposition results are not reported in the Chichester local plan HRA.

Table 3-17 shows that contributions from Chichester local plan comprise the majority (94.9% or higher) of the in combination total for the pollutants exceeding the CL, whilst the contribution from Havant comprises 5.1% or less. For the impact of greatest concern (nitrogen deposition), the Havant contribution is 0.2% of the in-combination total.

It can be concluded that whilst there is an in combination risk for nitrogen deposition, airborne NOx and airborne NH_3 impacts to Solent Maritime SAC, the contribution from the Havant Local Plan is small in the context of the wider impact. The scale of influence for the Havant Local Plan is negligible relevant to other plans and projects forming the large majority of the potential effect on Solent Maritime SAC. In this context, reductions in the Havant contribution, even if substantial in relative terms, would not result in a meaningful change in the integrity outcome for the site. Responsibility for addressing the in combination effect lies with those plans that constitute the dominant share of the impact.

Table 3-16 In combination assessment for Solent Maritime SAC: maximum modelled contributions to habitats from local plans

Pollutant	Deposition type	Min CL	Maximum modelled contribution			
			Havant	Chichester	In comb total	In comb total % of CL
Nutrient nitrogen deposition (kgN/ha-year)	Grassland	**5**	0.003	1.5	**1.5**	**30.5%**
Acid deposition (kEq/ha-year)	Grassland	**4.856**	0.0002	n/a	**<0.1**	**<0.1%**
Airborne NOx ($\mu g/m^3$)	n/a	**30**	0.05	0.9	**0.9**	**3.0%**

Airborne NH_3 ($\mu g/m^3$)	n/a	**1**	0.00004	0.1	**01**	**8.0%**

Table 3-17 In combination assessment for Solent Maritime SAC, percentage contributions

Pollutant	Deposition type	Min CL	In comb total % of CL	LP % contribution to in comb total	
				Havant	Chichester
Nutrient nitrogen deposition (kgN/ha-year)	Grassland	**5**	**30.5%**	0.2%	99.8%
Acid deposition (kEq/ha-year)	Grassland	**4.856**	**<0.1%**	100.0%	n/a
Airborne NOx ($\mu g/m^3$)	n/a	**30**	**3.0%**	5.1%	94.9%
Airborne NH_3 ($\mu g/m^3$)	n/a	**1**	**8.0%**	0.1%	99.9%

4. Conclusions and recommendations

This air quality screening assessment has demonstrated that pollutant contributions associated with the “Building a Better Future” Plan are well below the relevant screening thresholds for all designated sites within 10km of Havant. In all cases, the predicted process contributions (PCs) are less than 1% of the relevant critical levels and/or critical loads for NOx and NH_3 concentrations, and nutrient nitrogen and acid deposition, and therefore can be considered insignificant in accordance with established guidance (e.g. Environment Agency and Natural England).

The in combination assessment has demonstrated that there is risk for potential effects, with in combination total pollutant contributions exceeding 1% of the critical load or level for the following habitat sites and pollutants:

- Butser Hill SAC (UK0030103) – nutrient nitrogen deposition, airborne NOx and airborne NH_3
- Chichester and Langstone Harbours Ramsar (UK11013) and SPA (UK9011011) – nutrient nitrogen deposition, airborne NOx and airborne NH_3
- Kingley Vale SAC (UK0012767) – nutrient nitrogen deposition
- Pagham Harbour Ramsar (UK11052) and SPA (UK9012041) – nutrient nitrogen deposition, airborne NOx and airborne NH_3
- Portsmouth Harbour Ramsar (UK11055) and SPA (UK9011051) – nutrient nitrogen deposition, airborne NOx and airborne NH_3
- Solent and Dorset Coast SPA (UK9020330) – nutrient nitrogen deposition, airborne NOx and airborne NH_3
- Solent Maritime SAC (UK0030059) – nutrient nitrogen deposition, airborne NOx and airborne NH_3

However, the in combination results show that the contribution of the Havant Local Plan is consistently small in the context of the in combination impact. In isolation, the Havant Local Plan contributes 0.2% or less of the critical load or level. As a percentage of total in combination nutrient nitrogen deposition, NOx or NH_3 concentrations where there are in combination exceedances of the CL, Havant’s contribution is consistently 5.1% or less of the total. For the potential impact of greatest concern (nitrogen deposition), the contribution from the Havant Local Plan is consistently 0.1% to 0.5% of the total.

Therefore, reductions to the Havant contribution, even if substantial in terms of significant reductions to AADT, would not result in a meaningful reduction in the level of in combination exceedance for any pollutant in exceedance at any of the habitats.

It is concluded that the scale of influence for the Havant Local Plan is negligible relevant to other plans and projects forming the majority of the potential effect of in combination exceedances.

Responsibility for addressing the in combination effect lies with those plans and projects that constitute the dominant share of the impact.

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Appendices

Appendix A – Air Quality Modelling Methodology

A.1 Air Quality Modelling System

The RapidAIR Urban Air Quality Modelling Platform was used to predict air pollutant concentrations for this study. This is WSP's proprietary modelling system developed for urban air pollution assessment.

RapidAIR has been developed to provide graphic and numerical outputs which are comparable with other models used widely in the United Kingdom. The model approach is based on loose-coupling of three elements:

- Road traffic emissions modelling conducted using fleet specific algorithms to prepare grams/kilometre/second (g km-1 s-1) emission rates of NOx via the Defra Emissions Factors Toolkit (EFT) (Defra, 2026) and NH_3 (via RapidEMS, which incorporates emissions factors from the Calculator for Road Emissions of Ammonia (CREAM) (Air Quality Consultants, 2020).
- Convolution of an emissions grid with dispersion kernels derived from the US EPA AERMOD model (US EPA, no date), at resolutions ranging from 1 m to 20 m. AERMOD provides the algorithms which govern the dispersion of the emissions and is an accepted international model for road traffic studies.
- Running the kernel-based RapidAIR model and using GIS software to prepare dispersion fields of concentration for further analysis via a set of Python/arcpy decision-support tools coded by WSP.

RapidAIR includes an automated meteorological processor based on AERMET which obtains and processes meteorological data of a format suitable for use in AERMOD. Surface meteorological data is obtained from the NOAA online repository (NOAA, no date) and upper air data is downloaded from the NOAA Radiosonde database (NOAA, 2025).

The model produces high resolution concentration fields at the city scale (down to a 1 m scale) so is ideal for spatially detailed compliance modelling. The combination of an internationally recognised model code and careful parameterisation matching international best practice makes RapidAIR ideal for this study. A validation study has been conducted in London using the same datasets as the 2011 Defra air quality model inter-comparison study (Defra, 2011). Using the LAEI (London Atmospheric Emissions Inventory) 2008 data and the measurements for the same time period the model performance is consistent (and across some metrics performs better) than other modelling solutions currently in use in the UK (Masey *et al*., 2018) - this validation study has been published in Environmental Modelling and Software, in partnership with the University of Strathclyde.

A.2 Model domain

Dispersion modelling was carried out to forecast levels of air pollutants at a 3m x 3m grid resolution across the entire Havant boundary +10km buffer zone area. A grid height of 1.7m was modelled; this is a standard height for modelling road transport sources, to account for the effects of vehicle induced turbulence.

A.3 Sub-Regional Transport Model (SRTM)

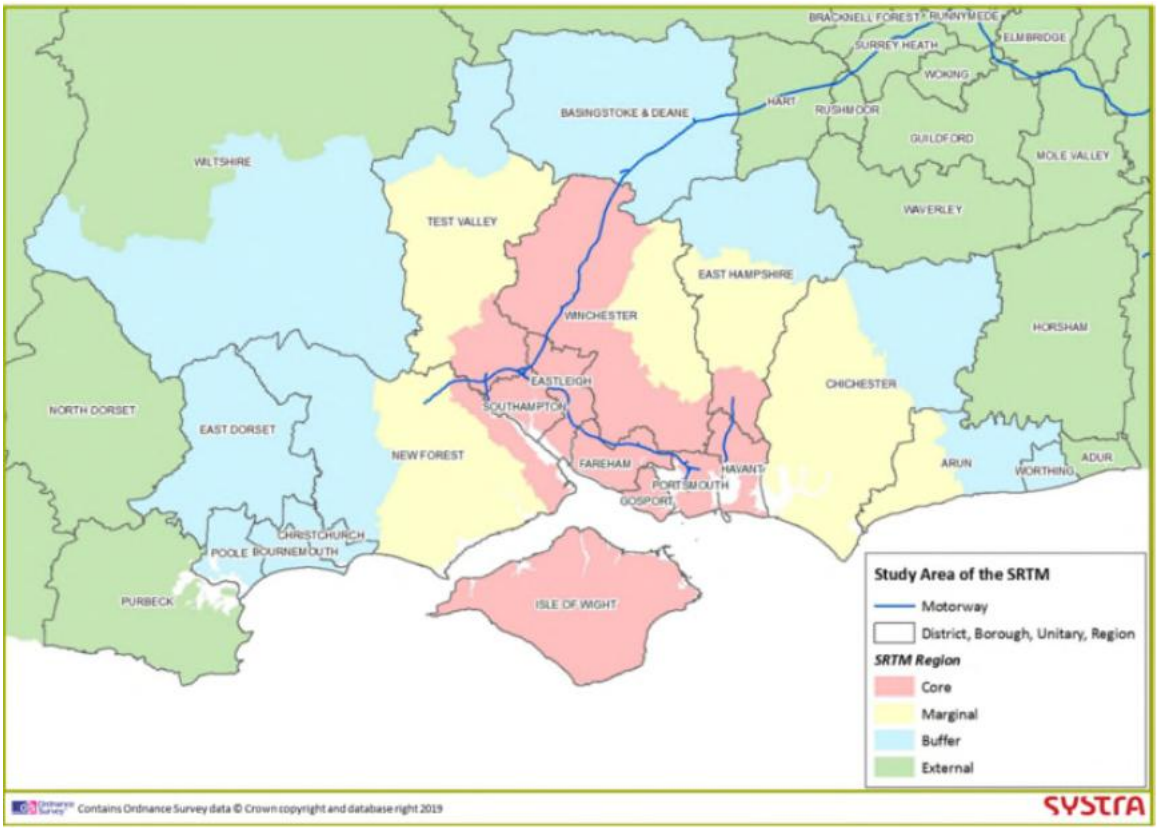
The SRTM includes four main model regions (core, marginal, buffer and external; Figure A-1), which have been modelled to varying levels of detail. The core region includes Test Valley (in part), New Forest (in part), Southampton, Eastleigh, Winchester (in part), Fareham, Gosport, Portsmouth, Havant, East Hampshire (in part) and Isle of Wight. Each of the four main model regions is further broken down into model zones. The zones within the core and marginal model regions are mainly based on groups of Census Output Areas (COAs) and Census Wards (CWs), respectively. Zones are based on Districts immediately outside the marginal model area, and on Counties in the model areas farther away. Key transport model parameters such as land use are specified by zone, and consequently the core model region has been modelled at the highest resolution and with the greatest level of detail; model resolution and detail decrease in zones farther away from the model core (SYSTRA, 2018).

The SRTM is a suite of linked models comprised of the following components (SYSTRA, 2018):

- Main Demand Model (MDM) which predicts when (frequency and time of day), where (destination choice) and how (choice of mode) journeys are made. Mode choices include car, public transportation, park & ride (a combination of car and public transportation), and active modes (walking and cycling).
- Gateway Demand Model (GDM) which predicts demand for travel from ports and airports.
- Road Traffic Model (RTM) which determines the routes taken by vehicles through the road network and journey times, accounting for congestion.
- Public Transport Model (PTM) which determines routes and services chosen by public transport passengers.
- Local Economic Impact Model (LEIM) which uses inputs including transport costs to forecast quantities and locations of households, populations and jobs.

The model components interact as demonstrated in Figure A-2.

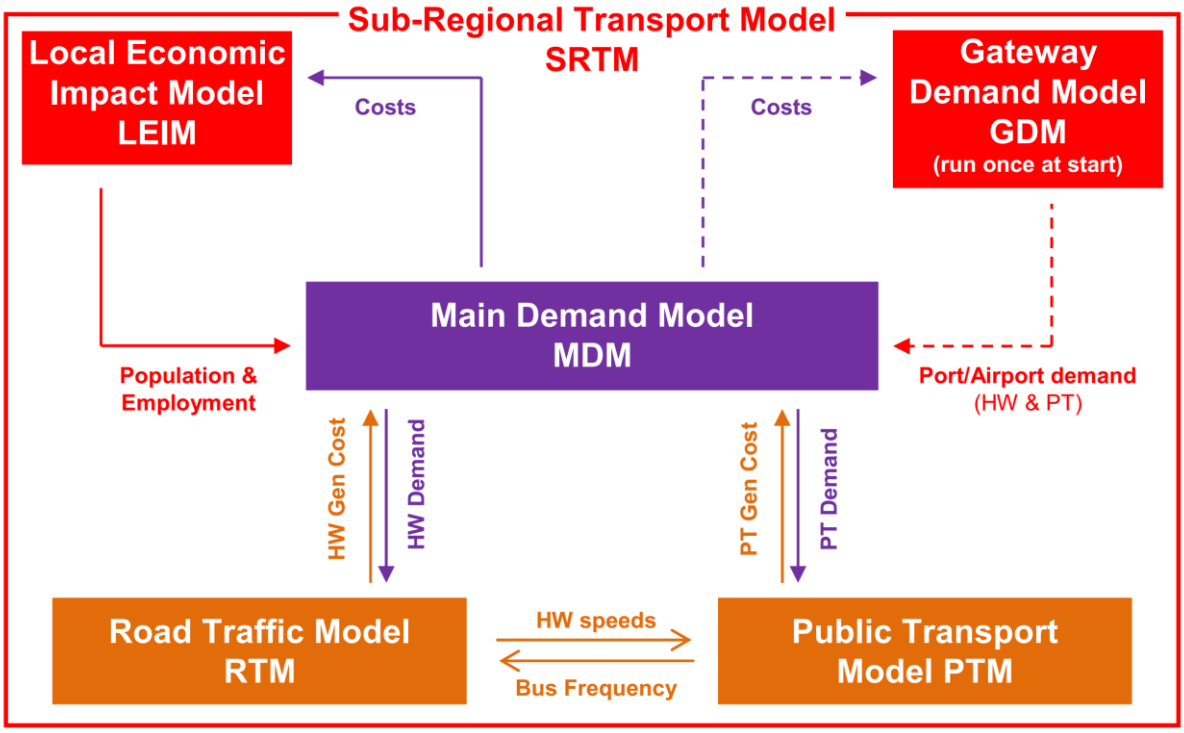
Figure A-1 SRTM geographical coverage (SYSTRA, 2018)



The SRTM is an evidence-based Land-Use and Transport Interaction model. The SRTM was originally developed, calibrated and validated against 2010 data and conditions, and included five forecast years: 2014, 2019, 2026, 2031, and 2036 (SYSTRA, 2018). Data sources included:

- Roadside interview survey data
- Rail Travel Survey
- Public transport origin destination data
- Ticket data for buses
- On board counts
- Manual and automatic traffic counts
- Journey time data
- Census Journey to Work Data
- National Travel Survey (NTS) Data
- National Trip End Model (NTEM) Data
- Population and Employment Data

Figure A-2 Interaction of models included in the SRTM5, (SYSTRA, 2018)



A.4 Traffic activity and speed data

Dispersion modelling was carried out for three scenarios which are summarised in Table A 1

The required data was then extracted from the grid results to provide a detailed evaluation of air quality impacts at locations within the designated site.

- 2019 Base Year
- 2046 Baseline (with no “Plan” allocations)
- 2046 Do Minimum (with “Plan” allocations)

The use of a base year traffic model scenario is used to undertake model verification through the comparison of dispersion model outputs for the reference year with air quality monitoring data obtained for the same period. The baseline traffic model was available for 2019, but it was considered that 2019 as a reference year for model verification purposes may not capture some of the post Covid-19 effects seen in commuter behaviour and average road traffic flows in the UK since 2021. 2024 provided the most recent year with validated air quality monitoring data for the full calendar year. The 2019 data was scaled to 2024 using factors developed through comparison of 2019 and 2024 traffic counts at Department for Transport traffic count points in Havant (non-motorways) and Hampshire (motorways). Scaling factors were calculated by vehicle type (car, light goods vehicle (LGV), Heavy goods vehicle (HGV) and buses), and applied to these vehicle flows provided in the 2019 baseline traffic model data by SYSTRA, to scale the 2019 data to 2024. The scaling factors presented in Table A-1 A-1 demonstrates that whilst both Hampshire and Havant

saw an increase in LGVs on the roads in 2024 compared to 2019, for all other vehicle types, there have been marginal decreases in traffic flow.

The SRTM traffic model includes modelled average speeds for each individual road links, which are used in emissions calculations for each link.

Table A-1 Scaling factors derived from Department for Transport count point data across Hampshire and Havant (note, there were no motorway count points in Havant, so a Hampshire Average was used).

Road category	Area	All motor vehicles	HGVs	Buses and coaches	Cars and taxis	LGVs
Motorway	Hampshire (Average)	97.19%	89.93%	88.94%	94.29%	118.15%
A roads and below	Havant	99.44%	92.94%	79.31%	96.98%	114.50%

A.5 Fleet composition

The SRTM traffic model provides traffic flow estimates for cars, light goods vehicles (LGVs), heavy goods vehicles (HGVs) and buses. AEI (National Atmospheric Emissions Inventory) fleet split information was then applied to further split cars into electric, hybrid (petrol hybrid, petrol plug-in hybrid and diesel hybrid), and petrol and diesel categories; and LGVs into electric, petrol and diesel categories, based on national average fleet composition information for urban and rural roads for 2024, and for 2046 for the future year scenarios.

For 2046, the SRTM traffic model fleet compositions were scaled according to factors calculated from national fleet compositions in 2024 and 2046, as provided in the NAEI fleet projections for those years (base year 2023), (NAEI, 2025). This ensured that the 2046 scenarios captured predicted increases in proportions of electric and hybrid cars and electric LGVs in the fleet.

A.5 Emission factors

Vehicle emission factors were obtained for NOx from Defra's Emissions Factors Toolkit (EFT) version 14 (Defra, 2026) and for NH_3 via RapidEMS. RapidEMS incorporates emissions factors from the Calculator for Road Emissions of Ammonia (CREAM) (Air Quality Consultants, 2025) and links directly to WSP's RapidAIR dispersion modelling system.

The input for RapidEMS consists of a basic fleet split based on vehicle categories (diesel cars, petrol cars, LGVs, articulated HGVs, rigid HGVs, and buses) according to the traffic activity information. RapidEMS is used to provide a more detailed parameterization of vehicle fleets in 2046 including all vehicles up to and including Euro 6/VI.

A.6 Meteorological data

RapidAIR includes an automated meteorological processor based on AERMET which obtains and processes meteorological data of a format suitable for use in AERMOD. Surface meteorological data is obtained from the NOAA online repository (NOAA, no date) and upper air data is downloaded from the NOAA Radiosonde database (NOAA, 2025). Meteorological data for 2024 was used in order to enable the model validation for this study.

For this study, 2024 surface meteorological data was obtained from three stations (Thorney Island, Wittering and Southampton, in that priority order) and upper air meteorological data was obtained from Herstmonceux West End, with gapfilling from Truro as the nearest secondary station available with strong data capture. RapidMET was used to carry out data filling where necessary according to the methodology provided by the US EPA in their "Meteorological Monitoring Guidance for Regulatory Modelling Applications" guidance document (US EPA, 2000). Data gaps from the primary meteorological station (E.g. Thorney Island, Herstmonceux West End) are first filled using data from the other nearby stations (Wittering and Southampton, and Truro).

A.7 Reference year modelling and model verification

This section provides a summary of the model verification process and the derivation of linear adjustment factors to improve model performance.

Verification of the model involves comparison of the modelled results with any local monitoring data at relevant locations; this helps to identify how the model is performing and if any adjustments should be applied. The verification process involves checking and refining the model input data with the aim of reducing uncertainties and produce model outputs that are in better agreement with the monitoring results. This can be followed by adjustment of the modelled results if required to reproduce measured levels as accurately as possible. The relevant procedures are set out in Defra's LAQM.TG(22) guidance (Defra, 2025). This recommends making the adjustment to the road contribution of the pollutant only and not the background concentration these are combined with.

1. **Oxides of nitrogen (NOx) and nitrogen dioxide (NO_2) model verification and adjustment**

The approach outlined in Chapter 7 of LAQM.TG(22) has been used in this case. To verify the model, the predicted annual mean Road NOx concentrations were compared with concentrations measured at the various monitoring sites during 2024.

Prior to conducting the model verification, a review of the monitoring site available from Havant Borough council for 2024 was conducted to define the monitoring sites relevant to include within the verification. 20 NO_2 diffusion tube monitoring sites located on the modelled road network with 2024 annual mean NO_2 concentrations available were used in the model verification.

The modelled vs measured concentrations at each of the monitoring locations were compared. Refinements were subsequently made to the model inputs to improve model performance where possible, and a linear **adjustment factor of 2.4056** was calculated for the road emissions component of the NOx model.

Total NOx was calculated as the sum of the adjusted NOx road contribution from RapidAIR and the Defra base year 2021 background maps for 2024 (Defra, 2024), with primary, trunk and motorway sources removed from the background map. Total NO_2 concentrations at specified receptors were

obtained from background and adjusted road NOx concentrations using the latest version of the NOx to NO_2 calculator provided by Defra (v9.1). Where annual NO_2 concentration maps were required, total NO_2 was derived using the following equation:

(Total NO_2 in $\mu g/m^3$) = -0.0014(Total NOx in $\mu g/m^3$)^2 + 0.5246(Total NOx in $\mu g/m^3$) + 3.0288

A plot comparing modelled and monitored total NO_2 concentrations during 2024 is presented in Figure A-3.

To evaluate model performance and uncertainty, the Root Mean Square Error (RMSE) for the observed vs predicted NO_2 annual mean concentrations was calculated, as detailed in Technical Guidance LAQM.TG(22). This guidance indicates that an RMSE of up to 4 $\mu g/m^3$ is ideal, and an RMSE of up to 10 $\mu g/m^3$ is acceptable. The calculated RMSE is presented in Table A-2. In this case the RMSE was calculated at 2.3992 $\mu g/m^3$, which is ideal.

Figure A-3 Predicted annual average NO2 concentrations against measured concentrations at monitoring locations. The 10% and 25% confidence intervals are also plotted.

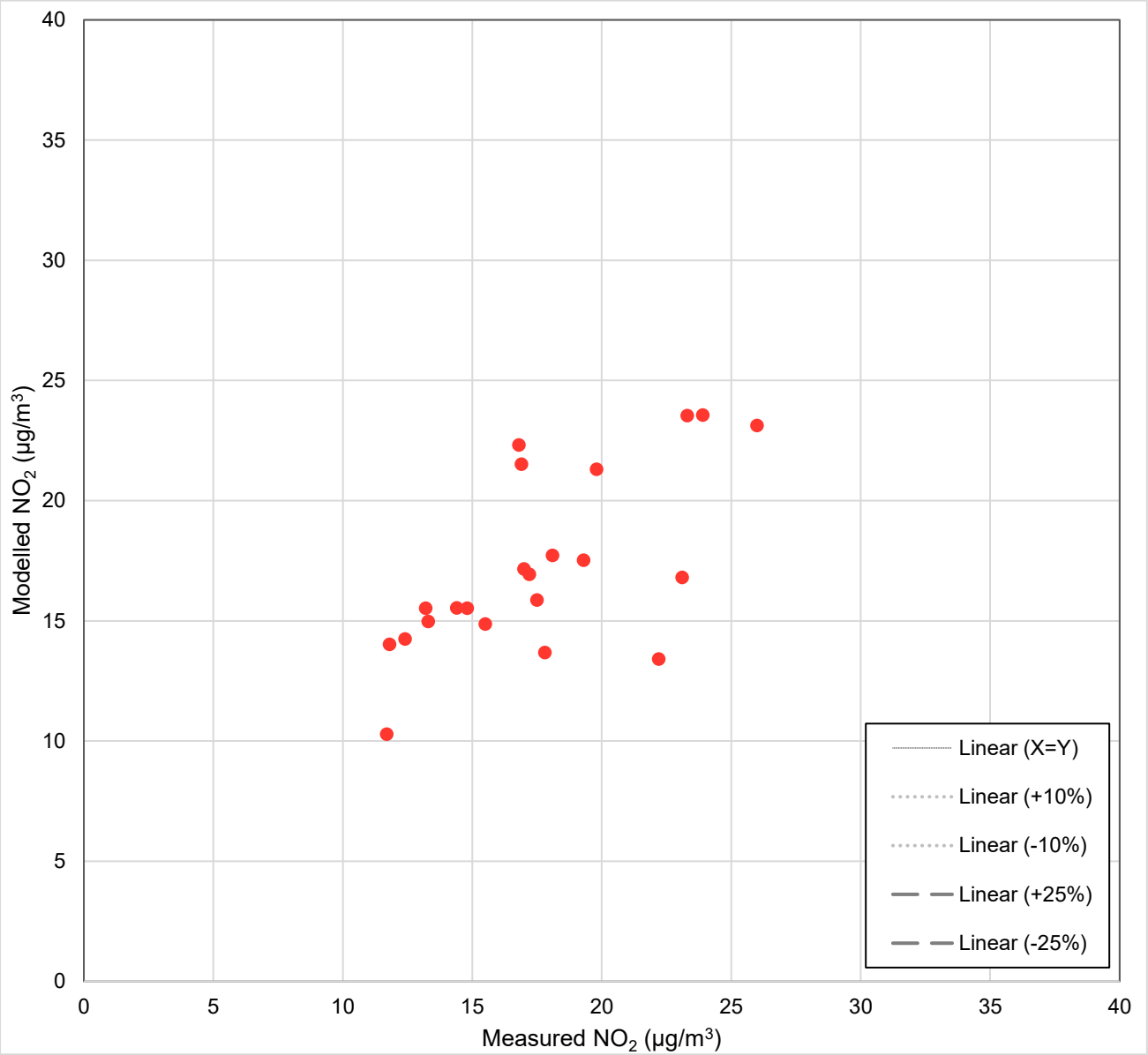


Table A-2 Modelled and measured NO_2 concentrations for the 2024 reference year and calculated RMSE value

Site ID	Measured NO_2 2024 (µg/m³)	Total Modelled NO_2 (µg/m³)	Difference (µg/m³)
2	16.8	22.3	5.5
3	22.2	13.4	-8.8
4	13.2	15.5	2.3
7B	18.1	17.7	-0.4

Legend

NO_2 annual mean concentration

- <= 20 µg/m³
- 20 - 25 µg/m³
- 25 - 30 µg/m³

8	17.8	13.7	-4.1
10	13.3	15.0	1.7
12	19.8	21.3	1.5
14	12.4	14.3	1.9
18	11.8	14.0	2.2
19C	23.9	23.6	-0.3
20	16.9	21.5	4.6
22	23.3	23.5	0.2
25	17.0	17.2	0.2
27	17.2	16.9	-0.3
28	26.0	23.1	-2.9
30	11.7	10.3	-1.4
31	19.3	17.5	-1.8
33	17.5	15.9	-1.6
34	15.5	14.9	-0.6
35	23.1	16.8	-6.3
37	14.8	15.5	0.7
38	14.4	15.5	1.1
		RMSE	**2.3992**

30 - 40 µg/m^3

> 40 µg/m^3

Ammonia (NH_3) model verification and adjustment

The "Development of CREAM Emissions Model Version 2" documentation (Logika Group, 2025) states that "CREAM V2 has been calibrated against ambient measurements using predictions made with ADMS-Roads. In most cases, this negates the requirement to verify model outputs against local measurements (although in those cases where roadside NH_3 measurements are available, local verification may still be helpful". There are no monitoring locations for NH_3 located within the study area, and therefore no further adjustment to the modelled concentrations for NH_3 were made.

A.8 Future scenario modelling

Airborne pollutant concentrations

For the two future 2046 scenarios, RapidAIR was used to generate pollutant concentration maps across the entire designated site at a 3m x 3m resolution. These maps were generated using transport model traffic activity data from the appropriate future scenario, emission factors for 2046 calculated using the EFT and RapidEMS, and 2024 meteorological data.

Pollutant concentration maps for road-only contributions (NOx, NO_2, and NH_3) were calculated using the adjustment factor described in Section A.7.7. Maps for total pollutant concentrations (NOx and NO_2) were calculated by adding the road-only concentration maps to the appropriate pollutant background map from the LAQM website. As the Defra base year 2021 background maps don't extend beyond 2040, 2040 background maps were used for the future modelling year of 2046 (with primary, trunk and motorway sources removed from the background map).

Pollutant deposition

Dry deposition rates of nutrient nitrogen and acid were calculated by multiplying the 1.5 m height level air concentration of the appropriate pollutants by the appropriate deposition velocity, followed by multiplication with a conversion factor.

Deposition velocities and conversion factors were obtained from Environment Agency guidance,[33] and are provided in the tables below.

Table A-3 Deposition velocities for NO_2 and NH_3

Pollutant	Vegetation type	Deposition velocity (m/s)
NO_2	Grassland (sites with short vegetation)	0.0015
	Woodland (sites with tall vegetation)	0.003
NH_3	Grassland (sites with short vegetation)	0.02
	Woodland (sites with tall vegetation)	0.03

Table A-4 Dry deposition conversion factors

Pollutant	Conversion factor for nitrogen deposition (from µg/m^2-s to kgN/ha-year)	Conversion factor for acid deposition (from µg/m^2-s to kEq/ha-year)
NO_2	95.9	6.84
NH_3	260	18.5

Sources of model uncertainty

There are a number of sources of model uncertainty inherent in this type of study, as discussed below:

- Uncertainties in the amount and distribution of development accounted for in the transport modelling. Household projections are revised from time to time and may vary from the values included in the transport model. Additionally, the transport model accounts for development growth and associated increases in background traffic within the core and buffer regions of the model. However, there will also be future development in the 'external' region which has not been included explicitly in the transport model.

- The amount and distribution of development described in the Plan will be subject to refinement as individual local plans are developed in further detail.
- Uncertainties introduced by the extent of the transport model data, which does not cover all roads in the domain area. Whilst Defra Background Map minor road pollutant contributions have been included to final pollutant concentrations, there is still a degree of uncertainty over minor roads in very close proximity to habitats.
- Uncertainties in the traffic model outputs on modelled road links, with regards to number of vehicles, type of vehicles and vehicle speed. These include uncertainties in calculating the number of EVs in the fleet in both the 2024 and 2046 fleets, and using national NAEI projections for EVs rather than localised data.
- Uncertainties in predicting baseline traffic activity data for 2024 using a base traffic model of 2019 and scaling to 2024 using Department for Transport 2019 and 2024 traffic counts.
- Uncertainties in the real-world emissions from Euro 6/VI vehicles. Early real-world emission test results of Euro 6 vehicles indicate mixed results, ranging from vehicles which met the Euro 6 standards under real-world driving emissions to vehicles which displayed NOx emissions up to 12 times higher than the Euro 6 standard (The Real Urban Initiative, no date; EQUA, no date).However, the increasing use of real-world emissions tests is likely to intensify pressure on vehicle manufacturers to comply with more stringent Euro standards. If real-world emissions do not decrease as anticipated, Havant may wish to review the current study in the context of updated emission parameters at some point in the future.
- Uncertainties in the background maps used to develop model adjustment factors and predict total modelled concentrations, with regards to other sources of pollution, such as industrial sources, domestic heating, port activity and forest fires.
- Uncertainties resulting from the lack of monitoring data for ammonia (NH_3). We have adopted a conservative approach in our analysis by using the NOx model adjustment factors we derived. This is expected to result in an over-prediction of the impacts associated with NH_3, including airborne NH_3 concentrations, nitrogen deposition and acid deposition. The incorporation of monitoring data for NH_3 would result in a more robust model.
- Uncertainties in the dispersion modelling process. These are accounted for so far as possible through the model verification process, but there inevitably remain some differences between modelled concentrations and the levels that would be measured in practice.

The use of a robust model verification process and adoption of a conservative approach is designed to take account of these uncertainties, ensuring that air quality impacts are more likely to be over-estimated than under-estimated.

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