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Contents

7. Air Quality Assessment Results

7.1 Introduction

7.1.1 This appendix supports and should be read in conjunction with Chapter 7: Air Quality (document reference 6.7) of the Environment Statement (ES) (Volume 6 of the Development Consent Order (DCO) application) for Norwich to Tilbury (the 'Project'). This appendix presents the results of the following assessments:

- Construction Dust Assessment
- Construction Traffic Assessment.

7.1.2 The Project has also been sub-divided into eight geographical sections (for reader accessibility, based largely on Local Planning Authority boundaries. These are shown on Figure 1.1: Site Location Plan and Project Sections (document reference 6.1.F1) and comprise:

- Section A – South Norfolk Council
- Section B – Mid-Suffolk District Council
- Section C – Babergh District Council, Colchester City Council and Tendring District Council
- Section D – Colchester City Council
- Section E – Braintree District Council
- Section F – Chelmsford City Council and Brentwood District Council
- Section G – Basildon Borough Council and Brentwood Borough Council (and part of Chelmsford City Council)
- Section H – Thurrock Council.

7.1.3 Results are reported with reference to the receptor and the Project Section in which they are located.

7.2 Construction Dust Assessment

7.2.1 This appendix provides the results of the assessment of construction-related activities on air quality. As described in Chapter 4: Project Description (document reference 6.4), the Project requires the following activities which relate to air quality:

- Construction and earthworks, with associated trackout[1]

[1] Institute of Air Quality Management (IAQM) guidance (IAQM, 2024) defines the Trackout as the transport of dust and dirt from the construction/demolition site onto the public road network, where it may be deposited and then re-suspended by vehicles using the network. This arises when heavy duty vehicles (HDVs) leave the construction/demolition site with dusty materials, which may then spill onto the road, and/or when HDVs transfer dust and dirt onto the road having travelled over muddy ground on site.

- Removal of existing infrastructure, including third party utilities diversions and / or modifications.

7.2.2 The construction dust assessment has been conducted for the eight Project Sections individually, to identify suitable risk profiles within the individual Local Planning Authority administrative areas for construction activities.

Magnitude of Impacts

7.2.3 The construction dust assessment has been summarised to indicate potential risk and identify locations which pose the greatest risks to air quality within each Project Section.

7.2.4 The magnitude of removal of existing infrastructure (pylons and overhead lines) has only been assessed for Section H, as it has been assumed that this is the only Section requiring for the removal of existing 400 kV pylons, to provide connection to the new Tilbury North Substation, in line with Chapter 4: Project Description (document reference 6.4). Additionally, third party modification works including the diversion, removal, undergrounding, or protection of existing overhead and underground third-party services are planned within Sections B, C and G, and so the dust emission magnitude of these modification activities has also been considered.

7.2.5 The magnitude of earthworks, construction and trackout activities have been assessed for all eight Project Sections.

Removal and / or Modification of Existing Infrastructure

7.2.6 The magnitude of removal and/or modification of existing infrastructure at Sections B, C, G and H has been classified as **small** in line with the IAQM guidance (IAQM, 2024), due to these works being assumed to mostly consist of the removal of existing steel pylons on site (metal has low potential for dust release), with anticipated volume <12,000 m^3.

Earthworks

7.2.7 The total site area of the Order Limits within each Project Section is outlined in Table A7.3.1, with all Project Sections falling into the **large** earthworks magnitude criteria of >110,000 m^2 (0.11 km^2) total site area for earthworks activities, as outlined in the IAQM guidance (IAQM, 2024).

Table A7.3.1 Approximate total site area per project section and magnitude of earthworks activities

Section	Approximate total site area (km^2)	Earthworks Magnitude (Large if >0.11 km^2)
A	344	Large
B	248	Large
C	214	Large
D	128	Large

Section	Approximate total site area (km^2)	Earthworks Magnitude (Large if >0.11 km^2)
E	113	Large
F	142	Large
G	104	Large
H	113	Large

Construction

7.2.8 As outlined in Chapter 4: Project Description (document reference 6.4), on-site concrete batching would take place at the four concrete batching plant compounds (three in Section C, one in Section D) within the Order Limits, with concrete pouring required to provide the new concrete foundation legs for the new pylons across the Order Limits. Table 4.5 in Chapter 4: Project Description (document reference 6.4) outlines the amount of material required throughout the construction of the Project.

7.2.9 The construction of various new ancillary buildings is also proposed to support the new East Anglia Connection Node (EACN) Substation (Section C) and the new Tilbury North Substation (Section H).

7.2.10 A Gas Insulated Switchgear (GIS) Hall building and associated annex is proposed at the new Tilbury North Substation with construction volume of approximately 64,800 m^3 using steel frames with metal cladding finish. Alongside this would be concrete pouring for the new pylon foundations and provision of Cable Sealing End (CSE) compounds across Section H. Therefore, the magnitude of potential dust emission from construction activities for Section H has been assigned to be **large.**

7.2.11 As outlined in Chapter 4: Project Description (document reference 6.4), several small buildings are to be constructed at the new EACN Substation (Section C). Therefore, the total construction volume across Section C is anticipated to exceed 75,000 m^3, considering the construction of new buildings, new pylon foundation provisions, new CSE compound, and underground cabling access. As such, the magnitude of potential dust emission from construction activities for Section H has been assigned as **large.**

7.2.12 For the remaining Project Sections, due to the considerable length of the Order Limits, with on-site concrete batching and piling (concrete pouring) to provide foundations for the 509 proposed pylons (159 km of proposed overhead lines), a worst-case assumption of **large** magnitude for the potential dust emission from construction activities has been assigned to each of the remaining Project Sections.

Trackout

7.2.13 The magnitude of trackout activities across the eight Project Sections has been classified as **high**, in line with the IAQM guidance (IAQM, 2024), with >50 Heavy-Duty Vehicles (HDV) trips to access across the Order Limits in any one day. Due to the scale of the Order Limits, the potential for unpaved road length within each Project Section has been assumed to exceed 100 m. As such, the magnitude of trackout activities across the eight Project Sections has been assigned to be **large.**

Magnitude Summary

7.2.14 Summary tables of the magnitude of the dust generating activities during the construction phase within each of the eight Project Sections is summarised in Table A7.3.2.

Table A7.3.2 Dust magnitude for dust generating activities – Sections A to H

Activity	Dust Emission Magnitude	Project Section
Removal and/or modification of existing infrastructure	Small	B, C, G and H
Earthworks	Large	A-H
Construction	Large	A-H
Trackout	Large	A-H

Sensitivity of Receptors

7.2.15 The sensitivity of the area is defined by determining the number of receptors using a set of distance criteria (20 m, 50 m, 100 m and 250 m) from the Institute of Air Quality Management construction guidance (Institute of Air Quality Management, 2024).

Section A – Sensitive Receptors

7.2.16 The sensitivity of the area for dust soiling is defined as **high** due to the presence of between 10 to 100 high sensitivity human receptors within 20 m of Section A.

7.2.17 The annual average Particulate Matter (10 micrometers or less in diameter) (PM_{10}) concentration estimated by Defra for the grid squares within and around Section A, in the baseline year of 2023, is 13.2 micrograms per cubic meter ($\mu g/m^3$), which is lower than 24 $\mu g/m^3$. Therefore, the sensitivity of the area around Section A to human health impacts has been assigned as **low.**

7.2.18 The Wortham Ling Site of Special Scientific Interest (SSSI), classed as a 'medium sensitivity receptor' to dust deposition, is located within 20 m of the Order Limits in Section A. There are additionally seven low sensitivity ancient woodland ecological sites and the **low** sensitivity Roydon Fen Local Nature Reserve (LNR) within 20 m of Section A. Therefore, the sensitivity of the area surrounding the Order Limits within Section A has been assigned as **medium** for ecological impacts from dust deposition in line with the IAQM guidance (IAQM, 2024).

Section A - Risk Categorisation of Dust Impacts

7.2.19 Taking into consideration the dust emission magnitude and the sensitivity of the area, Section A has been classified as high risk to dust soiling prior to mitigation, **low** risk to human health effects and medium risk to ecological effects from earthworks, construction and trackout as summarised in Table A7.3.3.

Table A7.3.3 Summary dust risk table prior to mitigation – Section A

Activity	Dust Soiling	Human Health	Ecological
Earthworks	High Risk	Low Risk	Medium Risk
Construction	High Risk	Low Risk	Medium Risk
Trackout	High Risk	Low Risk	Medium Risk

Section B - Sensitive Receptors

7.2.20 The sensitivity of the area for dust soiling surrounding Section B is defined as **high** due to the presence of between 10 to 100 high sensitivity human receptors within 20 m of the Order Limits.

7.2.21 The annual average PM_{10} concentration estimated by Defra for the grid squares within and around Section B, in the baseline year of 2023, is 12.7 µg/m^3, which is lower than 24 µg/m^3. Therefore, the sensitivity of the area to human health impacts surrounding Section B has been assigned as **low.**

7.2.22 Middle Wood, Offton SSSI is situated within 20 m of the Order Limits in Section B. SSSIs are considered to be 'medium sensitivity receptors' in line with IAQM guidance (IAQM, 2024). Additionally, there are also eight low sensitivity ancient woodland sites within 20 m of the Order Limits (Section B). Therefore, the sensitivity of the area surrounding the Order Limits within Section B has been assigned as **medium** to ecological impacts from dust deposition, in line with the IAQM guidance (IAQM, 2024).

Section B - Risk Categorisation of Dust Impacts

7.2.23 Taking into consideration the dust emission magnitude and the sensitivity of the area, Section B has been classified as **high** risk to dust soiling prior to mitigation, **low** risk to human health effects and medium risk to ecological effects from earthworks, construction and trackout as summarised in Table A7.3.4.

7.2.24 Considering the assumed small dust emission magnitude of the anticipated removal / and or modification of existing infrastructure works to be undertaken at Section B, Section B has been classified as **medium** risk to dust soiling, **negligible** to human health effects and low risk to ecological effects prior to mitigation for third party mitigation/modification activities.

Table A7.3.4 Summary dust risk table prior to mitigation – Section B

Activity	Dust Soiling	Human Health	Ecological
Removal and/or modification of existing infrastructure	Medium Risk	Negligible	Low Risk
Earthworks	High Risk	Low Risk	Medium Risk
Construction	High Risk	Low Risk	Medium Risk
Trackout	High Risk	Low Risk	Medium Risk

Section C - Sensitive Receptors

7.2.25 The sensitivity of the area for dust soiling surrounding Section C is defined as **high** due to the presence of between 10 to 100 high sensitivity human receptors within 20 m of the Order Limits.

7.2.26 The annual average PM_{10} concentration estimated by Defra for the grid squares within and around Section C, in the baseline year of 2023, is 12.8 µg/m^3, which is lower than 24 µg/m^3. Therefore, the sensitivity of the area to human health surrounding Section C has been assigned as **low.**

7.2.27 There are three low sensitivity ancient woodland ecological sites within 20 m of the Order Limits (Section C). Therefore, the sensitivity of the area surrounding the Order Limits within Section C has been assigned as **low** to ecological impacts from dust deposition, in line with the IAQM guidance (IAQM, 2024).

Section C - Risk Categorisation of Dust Impacts

7.2.28 Taking into consideration the dust emission magnitude and the sensitivity of the area, Section C has been classified as **high** risk to dust soiling prior to mitigation, low risk to human health effects and low risk to ecological effects from earthworks, construction and trackout as summarised in Table A7.3.5.

7.2.29 Considering the assumed small dust emission magnitude for the anticipated removal/and or modification of existing infrastructure works to be undertaken at Section C, Section C has been classified as **medium** risk to dust soiling, **negligible** to human health effects and **negligible** to ecological effects prior to mitigation for third party mitigation / modification activities.

Table A7.3.5 Summary dust risk table prior to mitigation – Section C

Activity	Dust Soiling	Human Health	Ecological
Removal and / or modification of existing infrastructure	Medium Risk	Negligible	Negligible
Earthworks	High Risk	Low Risk	Low Risk
Construction	High Risk	Low Risk	Low Risk
Trackout	High Risk	Low Risk	Low Risk

Section D - Sensitive Receptors

7.2.30 The sensitivity of the area for dust soiling surrounding Section D is defined as **high** due to the presence of between 10 to 100 high sensitivity human receptors within 20 m of the Order Limits.

7.2.31 The annual average PM_{10} concentration estimated by Defra for the grid squares within and around Section D, in the baseline year of 2023, is 12.9 µg/m^3, which is lower than 24 µg/m^3. Therefore, the sensitivity of the area to human health surrounding Section D has been assigned as **low.**

7.2.32 The medium sensitivity Marks Tey Brickpit SSSI is located within 20 m of the Order Limits in Section D. Additionally, there are four low sensitivity ancient woodland

ecological sites within 20 m of the Order Limits (Section D). Therefore, the sensitivity of the area surrounding the Order Limits within Section D has been assigned as **medium** to ecological impacts from dust deposition, in line with the IAQM guidance (IAQM, 2024).

Section D - Risk Categorisation of Dust Impacts

7.2.33 Taking into consideration the dust emission magnitude and the sensitivity of the area, Section D has been classified as **high** risk to dust soiling prior to mitigation, **low** risk to human health effects and **medium** risk to ecological effects from earthworks, construction and trackout as summarised in Table A7.3.6.

Table A7.3.6 Summary dust risk table prior to mitigation – Section D

Activity	Dust Soiling	Human Health	Ecological
Earthworks	High Risk	Low Risk	Medium Risk
Construction	High Risk	Low Risk	Medium Risk
Trackout	High Risk	Low Risk	Medium Risk

Section E - Sensitive Receptors

7.2.34 The sensitivity of the area for dust soiling surrounding Section E is defined as **high** due to the presence of between 10 to 100 high sensitivity human receptors within 20 m of the Order Limits.

7.2.35 The annual average PM_{10} concentration estimated by Defra for the grid squares within and around Section E, in the baseline year of 2023, is 13.0 µg/m^3, which is lower than 24 µg/m^3. Therefore, the sensitivity of the area to human health surrounding Section E has been assigned as **low.**

7.2.36 There are five low sensitivity ancient woodland ecological sites within 20 m of the Order Limits (Section E). Therefore, the sensitivity of the area surrounding the Order Limits within Section E has been assigned as **low** to ecological impacts from dust deposition, in line with the IAQM guidance (IAQM, 2024).

Section E - Risk Categorisation of Dust Impacts

7.2.37 Taking into consideration the dust emission magnitude and the sensitivity of the area, Section E has been classified as **high** risk to dust soiling prior to mitigation, **low** risk to human health effects and **low** risk to ecological effects from earthworks, construction and trackout as summarised in Table A7.3.7.

Table A7.3.7 Summary dust risk table prior to mitigation – Section E

Activity	Dust Soiling	Human Health	Ecological
Earthworks	High Risk	Low Risk	Low Risk
Construction	High Risk	Low Risk	Low Risk
Trackout	High Risk	Low Risk	Low Risk

Section F - Sensitive Receptors

7.2.38 The sensitivity of the area for dust soiling surrounding Section F is defined as **high** due to the presence of between 10 to 100 high sensitivity human receptors within 20 m of the Order Limits.

7.2.39 The annual average PM_{10} concentration estimated by Defra for the grid squares within and around Section F, in the baseline year of 2023, is 12.9 µg/m^3, which is lower than 24 µg/m^3. Therefore, the sensitivity of the area to human health surrounding Section F has been assigned as **low.**

7.2.40 The River Ter SSSI, classed as a 'medium sensitivity receptor' to dust deposition, is located within 20 m of the Order Limits in Section F. There are also nine low sensitivity ancient woodland ecological sites within 20 m of the Order Limits (Section F). Therefore, the sensitivity of the area surrounding the Order Limits within Section F has been assigned as **medium** to ecological impacts from dust deposition, in line with the IAQM guidance (IAQM, 2024).

Section F - Risk Categorisation of Dust Impacts

7.2.41 Taking into consideration the dust emission magnitude and the sensitivity of the area, Section F has been classified as **high** risk to dust soiling prior to mitigation, **low** risk to human health effects and **medium** risk to ecological effects from earthworks, construction and trackout as summarised in Table A7.3.8.

Table A7.3.8 Summary dust risk table prior to mitigation – Section F

Activity	Dust Soiling	Human Health	Ecological
Earthworks	High Risk	Low Risk	Medium Risk
Construction	High Risk	Low Risk	Medium Risk
Trackout	High Risk	Low Risk	Medium Risk

Section G - Sensitive Receptors

7.2.42 The sensitivity of the area for dust soiling surrounding Section G is defined as **medium** due to the presence of up to 10 high sensitivity human receptors within 20 m of the Order Limits.

7.2.43 The annual average PM_{10} concentration estimated by Defra for the grid squares within and around Section G, in the baseline year of 2023, is 12.9 µg/m^3, which is lower than 24 µg/m^3. Therefore, the sensitivity of the area to human health surrounding Section G has been assigned as **low.**

7.2.44 The Langdon Ridge SSSI medium sensitivity receptor is within 20 m of the Order Limits (Section G) alongside a single low sensitivity ancient woodland ecological site. Therefore, the sensitivity of the area surrounding the Order Limits within Section G has been assigned as **medium** to ecological impacts from dust deposition, in line with the IAQM guidance (IAQM, 2024).

Section G - Risk Categorisation of Dust Impacts

7.2.45 Taking into consideration the dust emission magnitude and the sensitivity of the area, Section G has been classified as **medium** risk to dust soiling prior to mitigation, **low**

risk to human health effects and **medium** risk to ecological effects from earthworks, construction and trackout as summarised in Table A7.3.9.

7.2.46 Considering the assumed small dust emission magnitude for the anticipated removal/and or modification of existing infrastructure works to be undertaken at Section G, Section G has been classified as **low** risk to dust soiling, **negligible** to human health effects and **low** risk to ecological effects prior to mitigation for third party modification activities.

Table A7.3.9 Summary dust risk table prior to mitigation – Section G

Activity	Dust Soiling	Human Health	Ecological
Removal and/or modification of existing infrastructure	Low Risk	Negligible	Low Risk
Earthworks	Medium Risk	Low Risk	Medium Risk
Construction	Medium Risk	Low Risk	Medium Risk
Trackout	Medium Risk	Low Risk	Medium Risk

Section H - Sensitive Receptors

7.2.47 The sensitivity of the area for dust soiling surrounding Section H is defined as **high** due to the presence of between 10 to 100 high sensitivity human receptors within 20 m of the Order Limits.

7.2.48 The annual average PM_{10} concentration estimated by Defra for the grid squares within and around Section H, in the baseline year of 2023, is 13.2 µg/m^3, which is lower than 24 µg/m^3. Therefore, the sensitivity of the area to human health surrounding Section H has been assigned as **low.**

7.2.49 There is one low sensitivity ancient woodland ecological site within 20 m of the Order Limits (Section H). Therefore, the sensitivity of the area surrounding the Order Limits within Section H has been assigned as **low** to ecological impacts from dust deposition, in line with the IAQM guidance (IAQM, 2024).

Section H - Risk Categorisation of Dust Impacts

7.2.50 Taking into consideration the dust emission magnitude and the sensitivity of the area, Section H has been classified as **high** risk to dust soiling prior to mitigation and **low** risk to human health effects from earthworks, construction and trackout activities.

7.2.51 Considering the assumed small dust emission magnitude for the anticipated removal of existing infrastructure works to be undertaken at Section H, Section H has been classified as **medium** risk to dust soiling and **negligible** to human health effects prior to mitigation. These levels of risk are summarised in Table A7.3.10.

Table A7.3.10 Summary dust risk table prior to mitigation – Section H

Activity	Dust Soiling	Human Health	Ecological
Removal and/or modification of existing infrastructure	Medium Risk	Negligible	Negligible
Earthworks	High Risk	Low Risk	Low Risk
Construction	High Risk	Low Risk	Low Risk
Trackout	High Risk	Low Risk	Low Risk

Significance of Effects

7.2.52 The finding that, without dust controls, there would be a high risk of impact has informed the dust management measures to be implemented as part of standard mitigation for the Project (see Section 7.6 of Chapter 7 and the Outline Code of Construction Practice (CoCP) (document reference 7.2)). Such measures are expected reduce the risk of impact to a negligible level. Therefore, the effect of dust emissions during the construction phase would be **negligible and not significant.**

7.3 Generators and Non-Road Mobile Machinery (NRMM)

7.3.1 No specific data on the exact location of equipment and generators to be used for the Project is available. The type of equipment to be used along with numbers of units and estimates of daily use are shown in Table A7.3.12. Work would be carried out along the length of the Project with concentrations of activity around temporary construction compounds and work areas.

7.3.2 Locations where temporary construction compounds are within 100 m of receptors have been reviewed using GIS and the results are provided in Table A7.3.11. A full list of the temporary construction compounds are shown in Table 4.7 in Chapter 4: Project Description (document reference 6.4).

7.3.3 Five temporary construction compounds / work areas have been identified as having receptors located within 100 m of the works boundary. The highway laydown areas have also been identified as having receptors within 100 m of the works boundary, for example the Bullen Lane site in Bramford has >10 receptors within 100 m. For all sites where receptors are located within 100 m, additional site management practices should be considered, where feasible. For example:

- Locating site equipment away from the nearest receptors and maximising the distance between the equipment and receptors
- Prioritising use of electric or low emissions equipment at these temporary construction compound areas
- Prioritising early engagement for provision of electrical supply to these temporary construction compound areas
- Consideration of load management software to minimise emissions
- Consideration of hording to provide a physical barrier to emissions

- Minimising equipment use through planning or prefabrication
- Installing additional flues to increase the release height of emission to aid dispersion if required.

7.3.4 Once the temporary construction compound areas and highways laydown area plans are considered, the solutions above should, where feasible, be built into the design to minimise emissions from the areas in Table A7.3.11. The locations of the following are shown on Figure 4.1: Proposed Project Design (document reference 6.4.F1).

Table A7.3.11 Human receptors within 100 m of temporary construction compounds

Temporary construction compounds	Number of Human Receptors
Temporary construction compounds (TB-SC04 and TB-CC03)	3
Temporary construction compound (JC-CC05)	1
Highways Laydown Areas (Project wide)	32
Construction Laydown Areas (JC Route)	1
Construction Laydown Areas (RG Route)	5
Construction Laydown Areas (TB Route)	14

Table A7.3.12 Key construction activities and plant usage

Key Construction activity	Plant Description	Number of Units	Approximate Time for Construction Activity	Approximate Hours of Operation	Approximate Daily Usage
Enabling Works					
Vegetation clearance and tree cutting	Chain saws and woodchippers	6	502 days	7:30am -6pm	Used for 80% of the day
Gound investigation	Pioneer drilling rig	2	222 days	7:30am -6pm	Used for 80% of the day
Construction of haul roads and working areas	360 Excavators	24	167 days	7:30am -6pm	Used for 80% of the day
Construction of bell mouth		20	124 days	7:30am -6pm	Used for 80% of the day
Construction of foundations		21	480 days	7:30am -6pm	Used for 80% of the day
Construction of temporary construction compounds		4	168 days	7:30am -6pm	Used for 80% of the day
Construction of satellite yards		4	44 days	7:30am -6pm	Used for 80% of the day
Installing culverts		5	140 days	7:30am -6pm	Used for 80% of the day
Installing Bridges		5	140 days	7:30am -6pm	Used for 80% of the day
Horizontal directional drilling - excavate		2	100 days	7:30am -6pm	Used for 90% of the day

Key Construction activity	Plant Description	Number of Units	Approximate Time for Construction Activity	Approximate Hours of Operation	Approximate Daily Usage
launch and receive pits (Motts to advise)					
Underground cable - Open and cut trenching (Motts to advise)		4	810 days	7:30am -6pm	Used for 80% of the day
Construction of temporary construction compounds	Bulldozers	4	168 days	7:30am -6pm	Used for 80% of the day
Construction of satellite yards		4	44 days	7:30am -6pm	Used for 80% of the day
Construction of haul roads and working areas		24	167 days	7:30am -6pm	Used for 80% of the day
Haul roads -moving soil	Dumper truck Bell 30 T	24	167 days	7:30am -6pm	Used for 80% of the day
Satellites yards-moving soil		2	44 days	7:30am -6pm	Used for 80% of the day
Installing culverts		5	140 days	7:30am -6pm	Used for 80% of the day
Installing Bridges		5	140 days	7:30am -6pm	Used for 80% of the day
foundations-moving soil		21	480 days	7:30am -6pm	Used for 80% of the day
Temporary construction compounds-moving soil		2	168 days	7:30am -6pm	Used for 80% of the day

Key Construction activity	Plant Description	Number of Units	Approximate Time for Construction Activity	Approximate Hours of Operation	Approximate Daily Usage
Haul roads and working areas	Vibratory Rollers	24	167days	7:30am -6pm	Used for 20% of the day
Construction of Bellmouth		20	124 days	7:30am -6pm	Used for 20% of the day
Construction of satellite yards		4	44 days	7:30am -6pm	Used for 20% of the day
Construction of temporary construction compounds		4	168 days	7:30am -6pm	Used for 20% of the day
Construction of satellite yards	Tele-handlers JCB 17 m	4	1830 days	7:30am -6pm	Used for 75% of the day
Construction of temporary construction compounds		4	1830 days	7:30am -6pm	Used for 75% of the day
Machine site-Lifting and moving drums and equipment		2	785 days	7:30am -6pm	Used for 75% of the day
Tower Assembly	360 Telehandler	10	360 days	7:30am -6pm	Used for 50% of the day
Tower erection (part)		10	360 days	7:30am -6pm	Used for 50% of the day
Conductor stringing	Puller	1	785 days	7:30am -6pm	Used for 20% of the day
	Tensioner	1	785 days	7:30am -6pm	Used for 20% of the day

Key Construction activity	Plant Description	Number of Units	Approximate Time for Construction Activity	Approximate Hours of Operation	Approximate Daily Usage
	Towable Winch	5	785 days	7:30am -6pm	Used for 20% of the day
Installing pile Foundations	Drilling piling rigs	6	TBC	7:30am -6pm	Used for 80% of the day
Downleads	Mobile Elevated Work Platforms (MEWPs)	2	24 days	7:30am -6pm	Used for 50% of the day
Construction of temporary construction Compounds	Large Generators up to 2,500 kVA	2	1,830 days	7:30am -6pm	Used for 100% of the day
Construction of satellite yards	Large Generators up to 2,500 kVA	2	1830 days	7:30am -6pm	Used for 100% of the day
Installing foundations	Small 5 kVA generators	21	480 days	7:30am -6pm	Used for 40% of the day
Deploying bonds across rivers	Inland waterway vessels	2	TBC	7:30am -6pm	Used for 10% of the day
Installing foundations	Static pumps	21	480 days	7:30am -6pm	Used for 75% of the day
Deploying bonds	Drones	2	TBC	7:30am -6pm	Used for 10% of the day
Stringing conductor - Pressing joints	Hydraulic power packs	6	785 days	7:30am -6pm	Used for 40% of the day

7.4 Construction Traffic

Model Verification

7.4.1 The model results at existing monitoring locations were used for model verification based on the method set out in Appendix 7.1: Air Quality Assessment Methodology (document reference 6.7.F1).

7.4.2 Verification has been completed using six monitoring sites across the Order Limits. Where appropriate, the locations on the monitoring sites were updated following location reviews.

7.4.3 Verification followed the methodology outlined in Local Air Quality Management (LAQM) Technical Guidance (LAQM, 2022). The following method has been used:

- Comparison of the modelled road Nitrogen Oxide (NOx) versus the monitored road NOx. Road NOx measured at the diffusion tube monitoring sites was calculated using the latest Department for Environment, Food and Rural Affairs (Defra) NOx to Nitrogen Dioxide (NO_2) calculator
- A verification factor was calculated based on the regression equation and this was applied to the modelled road NOx concentrations
- The adjusted modelled road NOx contribution was then used to calculate the total NO_2 using the Defra NOx to NO_2 calculator.

7.4.4 The air quality monitoring data collected as part of this assessment was reviewed to determine the suitability of each of the monitoring locations for inclusion in the model verification process. The criteria used to determine the suitability of the monitoring data for inclusion into the verification process is outlined below:

- Monitoring locations were required to be within 200 m of a road within the Order Limits
- Monitoring data in 2023 was required to have a data capture of ≥75 %
- Monitoring data influenced by major road emissions sources which were missing from the traffic model, and hence could not be included in the dispersion model was excluded
- Monitoring data from sites where the exact location could not be accurately identified or validated was excluded.

7.4.5 Ten monitoring sites were not used in the verification process, and the reasons are detailed in Table A7.3.13.

7.4.6 Table A7.3.14 provides the verification details, and graphs showing the model performance for the Project are shown on A7.3.1. As the model verification factor is more than one, the results have been adjusted to provide a conservative assessment.

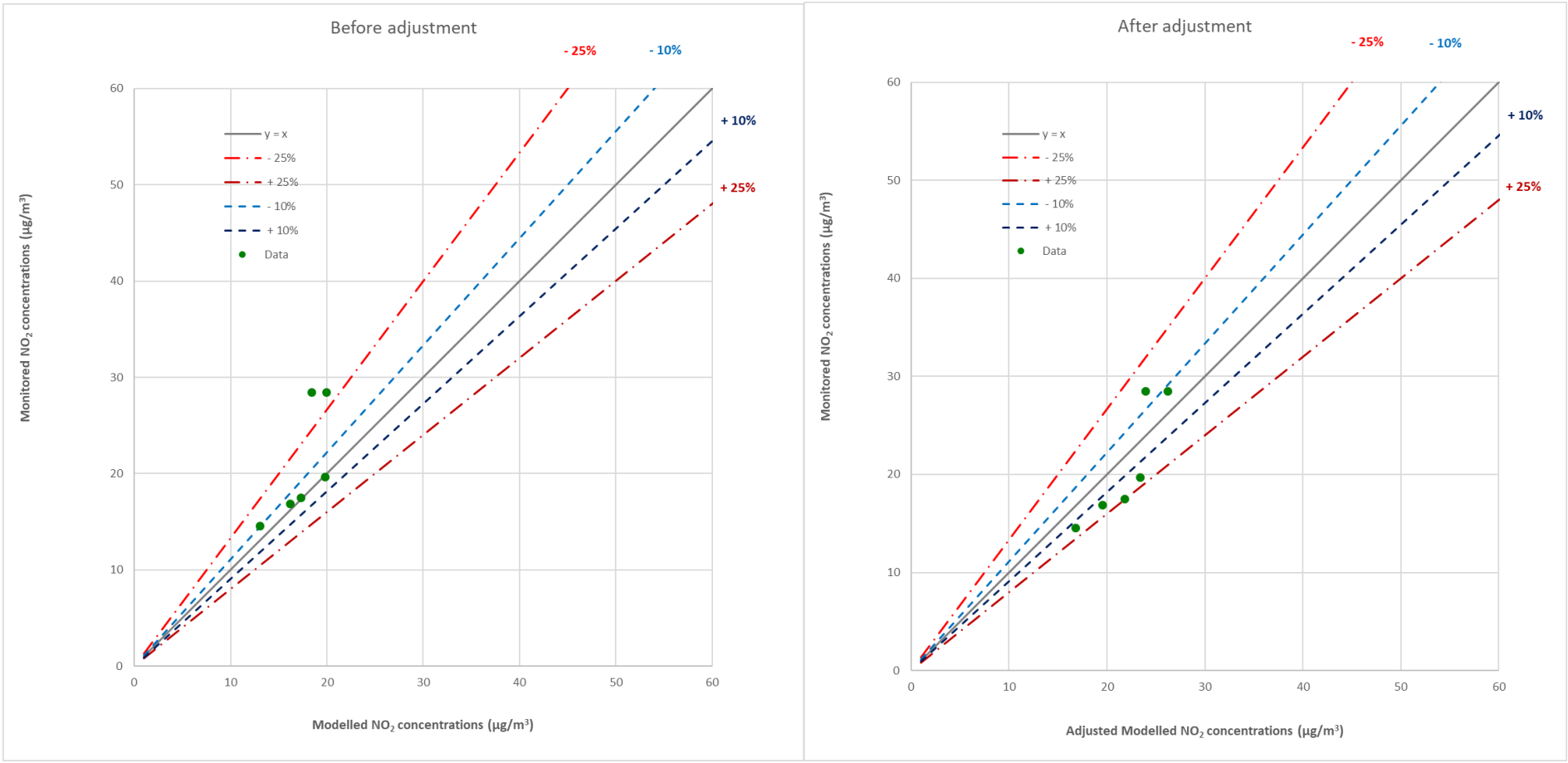
Table A7.3.13 Monitoring sites removed from the verification process

Site ID	Location	Project Section (s)	Reasoning
BR13	Bridge Street Witham	Section E	This tube is located at a complex junction. The modelling can't replicate conditions at a complex junction, causing the model to underpredict at this location.
BRW26	289 Chelmsford Road - telegraph pole	Section F and G	This tube is located adjacent to a bus stop. The modelling can't replicate conditions at a bus stop, causing the model to underpredict at this location.
BRW29	Thorndon Avenue / A127	Section F and G	The exact location of this diffusion tube could not be accurately identified and therefore was excluded.
BRW30	8 Trimble	Section F and G	The exact location of this diffusion tube could not be accurately identified and therefore was excluded.
CB13	60 Roxwell Road	Section F	There is no monitoring data available for the baseline year of 2023, therefore this site has been excluded from the verification.
CB36	2 Rainsford Lane	Section F	This tube is located <1 m from the road and therefore is located too close to the road for suitable model verification.
CBC135	85 Coggeshall Road	Section D	The exact location of this diffusion tube could not be accurately identified and therefore was excluded.
CBC137	93B Coggeshall Road	Section D	The exact location of this diffusion tube could not be accurately identified and therefore was excluded.
DT30	Clacton Hospital / Sea Front	Section A	There is no monitoring data available for the baseline year of 2023, therefore this site has been excluded from verification.
TILC	St Andrews Road (Tilbury) (R)	Section H	The exact location of this diffusion tube could not be accurately identified and therefore was excluded.
BRW39	Thorndon	Section G	The exact location of this diffusion tube could not be accurately identified and therefore was excluded.

Table A7.3.14 Model performance

Adjustment Factor	1.72
Within +10%	0
Within -10%	1
Within +-10%	1
Within +10 to 25%	4
Within -10 to 25%	1
Within +-10 to 25%	5
Over +25%	0
Under -25%	0
Greater +-25%	0
Within +-25%	6
Total	6
Uncertainties Assessment	
Correlation	0.866
Root Mean Square Error (µg/m3)	3.398
Fractional bias	-0.045

Image A7.3.1 Model performance



Human Receptors

7.4.7 This section describes the predicted concentrations at human receptor locations as a result of the Project in the modelled year (2030) when there would be a change in vehicle flows which meet the Environmental Protection UK (EPUK) / IAQM guidance screening criteria (EPUK and IAQM, 2017).

7.4.8 The modelled NO_2, PM_{10} and Particulate Matter (2.5 micrometers or less in diameter (PM2.5) concentrations and magnitude of change for all 59 human receptors modelled are presented for the Project in Table A7.3.15 to Table A7.3.17. There were no predicted exceedances of the air quality standard for all pollutants assessed in all three scenarios (Baseline, Do Minimum (DM) and Do Something (DS)).

NO_2 Results

7.4.9 Predicted concentrations are below the annual mean air quality standard (40 µg/m^3) at all sensitive receptor locations for each of the Baseline, DM and DS scenarios.

7.4.10 The highest concentration was recorded at receptor HR_56, a residential receptor on Thorndon Avenue, located adjacent to the A127 (Section G) and was 16.5 µg/m^3 in the DM scenario and 16.6 µg/m^3 in the DS scenario.

7.4.11 The magnitude of change to annual mean NO_2 concentrations at all receptor locations is predicted to be **negligible** and therefore **not significant** according to EPUK / IAQM guidance (EPUK and IAQM, 2017).

PM_{10} Results

7.4.12 The predicted annual mean concentrations of PM_{10} for all three scenarios (Baseline, DM and DS) at each receptor. Predicted concentrations are below the annual mean air quality standard (40 µg/m^3) at all sensitive receptor locations for each of the Baseline, DM and DS scenarios.

7.4.13 The highest concentration was recorded at receptor HR_43, a residential receptor on Priory Lane located approximately 40 m south of the A131, to the south-west of Braintree (Section E) and was 16.4 µg/m^3 in the DM scenario and 16.4 µg/m^3 in the DS scenario (to one decimal place).

7.4.14 The magnitude of change to annual mean PM_{10} concentrations at all receptor locations is predicted to be **negligible** and therefore **not significant** according to EPUK / IAQM guidance (EPUK and IAQM, 2017).

$PM_{2.5}$ Results

7.4.15 The predicted annual mean concentrations of $PM_{2.5}$ for all three scenarios (Baseline, DM and DS) at each receptor. Predicted concentrations are below the annual mean air quality target (12 µg/m^3, to be achieved by 31 January 2028) at all of the sensitive receptor locations for each modelled scenario. In addition, the predicted annual mean $PM_{2.5}$ concentrations at all receptors meet the 10 µg/m^3 legal target to be achieved by 2040.

7.4.16 The highest concentration was recorded at receptor HR_38, a nursery school on Halstead Road, Colchester located adjacent to the A12 (Section D) and was 7.6 µg/m^3 in the DM scenario and 7.6 µg/m^3 in the DS scenario (to one decimal place).

Summary

7.4.17 There were no predicted exceedances of the standard for annual mean NO_2, PM_{10} and $PM_{2.5}$ at human receptor locations along the affected road network.

7.4.18 The magnitude of change at all receptors, for all pollutants assessed is considered to be **negligible** and therefore **not significant**.

Table A7.3.15 Air quality NO_2 human receptor results

Receptor ID	Project Section(s)	2023 Baseline (µg/m^3)	2030 DM (µg/m^3)	2030 DS (µg/m^3)	Magnitude of Change (µg/m^3)	Impact Descriptor
HR_1	Section A	6.9	5.4	5.4	<0.1	Negligible
HR_2	Section A	16.1	9.9	10.1	0.2	Negligible
HR_3	Section A	7.8	5.8	5.9	<0.1	Negligible
HR_4	Section B	8.7	6.0	6.1	0.1	Negligible
HR_5	Section B	5.6	4.5	4.5	<0.1	Negligible
HR_6	Section B	6.6	5.0	5.0	0.1	Negligible
HR_7	Section B	6.6	5.0	5.1	0.1	Negligible
HR_8	Section B	5.9	4.7	4.7	<0.1	Negligible
HR_9	Section B	11.3	7.9	8.0	0.1	Negligible
HR_10	Section B	10.8	7.2	7.3	<0.1	Negligible
HR_11	Section B	8.8	6.3	6.4	0.1	Negligible
HR_12	Section B	6.1	4.9	4.9	<0.1	Negligible
HR_13	Section B	18.3	11.7	11.8	0.2	Negligible
HR_14	Section B	6.4	5.1	5.1	<0.1	Negligible
HR_15	Section B	8.9	6.7	7.0	0.3	Negligible
HR_16	Section C	7.1	5.5	5.5	<0.1	Negligible
HR_17	Section C	24.6	14.4	14.7	0.3	Negligible
HR_18	Section C	20.5	12.3	12.5	0.2	Negligible

Receptor ID	Project Section(s)	2023 Baseline (µg/m^3)	2030 DM (µg/m^3)	2030 DS (µg/m^3)	Magnitude of Change (µg/m^3)	Impact Descriptor
HR_19	Section C	12.6	8.5	8.5	<0.1	Negligible
HR_20	Section C	6.9	5.3	5.3	<0.1	Negligible
HR_21	Section C	11.1	7.3	7.4	0.1	Negligible
HR_22	Section C	14.0	8.9	9.0	0.1	Negligible
HR_23	Section C	15.2	9.5	9.7	0.2	Negligible
HR_24	Section C	13.8	8.8	8.9	0.2	Negligible
HR_25	Section C	8.2	6.1	6.2	<0.1	Negligible
HR_26	Section D	8.2	6.0	6.1	0.1	Negligible
HR_27	Section D	7.6	5.7	5.8	<0.1	Negligible
HR_28	Section C	17.0	10.6	10.9	0.2	Negligible
HR_29	Section C	8.1	6.1	6.1	<0.1	Negligible
HR_30	Section C	16.2	10.9	11.0	0.2	Negligible
HR_31	Section C	7.3	5.6	5.7	0.1	Negligible
HR_32	Section D	19.9	12.2	12.3	0.1	Negligible
HR_33	Section D	18.8	11.4	11.5	0.1	Negligible
HR_34	Section D	11.1	7.7	7.8	0.0	Negligible
HR_35	Section D	11.8	8.0	8.1	0.1	Negligible
HR_36	Section D	14.3	9.7	10.0	0.3	Negligible
HR_37	Section D	9.7	6.8	6.9	0.1	Negligible

Receptor ID	Project Section(s)	2023 Baseline (µg/m^3)	2030 DM (µg/m^3)	2030 DS (µg/m^3)	Magnitude of Change (µg/m^3)	Impact Descriptor
HR_38	Section D	27.2	16.1	16.2	0.1	Negligible
HR_39	Section D	18.7	11.5	11.6	0.1	Negligible
HR_40	Section D	26.1	15.7	15.8	0.1	Negligible
HR_41	Section D	8.4	6.2	6.3	0.1	Negligible
HR_42	Section D	7.8	5.8	5.9	<0.1	Negligible
HR_43	Section D	19.4	11.6	11.7	0.2	Negligible
HR_44	Section D	11.7	7.7	7.8	0.1	Negligible
HR_45	Section E	18.8	11.5	11.6	0.2	Negligible
HR_46	Section E	12.0	8.2	8.2	0.1	Negligible
HR_47	Section E	7.2	5.6	5.6	<0.1	Negligible
HR_48	Section E	10.7	7.5	7.6	0.1	Negligible
HR_49	Section E	10.7	7.5	7.6	0.1	Negligible
HR_50	Section F	7.2	5.7	5.7	<0.1	Negligible
HR_51	Section F	12.8	8.7	8.8	0.1	Negligible
HR_52	Section F	17.6	12.2	12.3	0.1	Negligible
HR_53	Section F	8.1	6.3	6.4	<0.1	Negligible
HR_54	Section F	20.0	13.3	13.5	0.1	Negligible
HR_55	Section G	22.0	14.7	14.7	<0.1	Negligible
HR_56	Section G	25.9	16.5	16.6	<0.1	Negligible

Receptor ID	Project Section(s)	2023 Baseline (µg/m^3)	2030 DM (µg/m^3)	2030 DS (µg/m^3)	Magnitude of Change (µg/m^3)	Impact Descriptor
HR_57	Section H	17.7	13.4	13.4	0.1	Negligible
HR_58	Section H	24.2	16.1	16.2	0.1	Negligible
HR_59	Section H	21.6	14.9	15.0	0.1	Negligible

Table A7.3.16 Air quality PM_{10} human receptor results

Receptor ID	Project Section(s)	2023 Baseline (µg/m^3)	2030 DM (µg/m^3)	2030 DS (µg/m^3)	Magnitude of Change (µg/m^3)	Impact Descriptor
HR_1	Section A	12.3	11.7	11.7	<0.1	Negligible
HR_2	Section A	13.5	12.9	13.0	<0.1	Negligible
HR_3	Section A	11.0	10.4	10.5	<0.1	Negligible
HR_4	Section B	12.0	11.4	11.4	<0.1	Negligible
HR_5	Section B	12.7	12.1	12.1	<0.1	Negligible
HR_6	Section B	12.2	11.6	11.6	<0.1	Negligible
HR_7	Section B	12.3	11.8	11.8	<0.1	Negligible
HR_8	Section B	12.4	11.9	11.9	<0.1	Negligible
HR_9	Section B	16.4	15.8	15.8	<0.1	Negligible
HR_10	Section B	13.7	13.1	13.2	<0.1	Negligible
HR_11	Section B	14.4	13.9	13.9	<0.1	Negligible
HR_12	Section B	12.9	12.4	12.4	<0.1	Negligible
HR_13	Section B	15.4	14.8	14.9	0.1	Negligible
HR_14	Section B	12.5	11.9	11.9	<0.1	Negligible
HR_15	Section B	12.1	11.5	11.6	0.1	Negligible
HR_16	Section C	13.0	12.4	12.4	<0.1	Negligible
HR_17	Section C	16.5	15.9	16.0	0.1	Negligible
HR_18	Section C	16.2	15.6	15.6	0.1	Negligible

Receptor ID	Project Section(s)	2023 Baseline (µg/m^3)	2030 DM (µg/m^3)	2030 DS (µg/m^3)	Magnitude of Change (µg/m^3)	Impact Descriptor
HR_19	Section C	13.3	12.7	12.8	<0.1	Negligible
HR_20	Section C	13.2	12.6	12.6	<0.1	Negligible
HR_21	Section C	14.6	14.0	14.0	<0.1	Negligible
HR_22	Section C	14.4	13.8	13.8	<0.1	Negligible
HR_23	Section C	15.0	14.4	14.4	<0.1	Negligible
HR_24	Section C	15.1	14.5	14.5	<0.1	Negligible
HR_25	Section C	12.5	11.9	11.9	<0.1	Negligible
HR_26	Section D	13.0	12.5	12.5	<0.1	Negligible
HR_27	Section D	13.1	12.5	12.5	<0.1	Negligible
HR_28	Section C	14.1	13.5	13.5	0.1	Negligible
HR_29	Section C	12.5	11.9	11.9	<0.1	Negligible
HR_30	Section C	14.3	13.7	13.7	<0.1	Negligible
HR_31	Section C	13.0	12.4	12.4	<0.1	Negligible
HR_32	Section D	14.1	13.5	13.5	<0.1	Negligible
HR_33	Section D	15.2	14.6	14.6	<0.1	Negligible
HR_34	Section D	13.4	12.8	12.8	<0.1	Negligible
HR_35	Section D	13.5	12.9	12.9	<0.1	Negligible
HR_36	Section D	13.3	12.8	12.9	0.1	Negligible
HR_37	Section D	13.0	12.4	12.4	<0.1	Negligible

Receptor ID	Project Section(s)	2023 Baseline (µg/m^3)	2030 DM (µg/m^3)	2030 DS (µg/m^3)	Magnitude of Change (µg/m^3)	Impact Descriptor
HR_38	Section D	16.0	15.4	15.4	<0.1	Negligible
HR_39	Section D	15.3	14.7	14.8	<0.1	Negligible
HR_40	Section D	15.1	14.5	14.5	<0.1	Negligible
HR_41	Section D	13.4	12.8	12.8	<0.1	Negligible
HR_42	Section D	13.2	12.6	12.7	<0.1	Negligible
HR_43	Section D	16.9	16.4	16.4	<0.1	Negligible
HR_44	Section D	13.5	12.9	12.9	<0.1	Negligible
HR_45	Section E	14.7	14.1	14.1	<0.1	Negligible
HR_46	Section E	13.7	13.1	13.2	<0.1	Negligible
HR_47	Section E	13.1	12.5	12.6	<0.1	Negligible
HR_48	Section E	13.1	12.6	12.6	<0.1	Negligible
HR_49	Section E	13.1	12.6	12.6	<0.1	Negligible
HR_50	Section F	13.3	12.7	12.7	<0.1	Negligible
HR_51	Section F	13.4	12.9	12.9	<0.1	Negligible
HR_52	Section F	13.5	12.8	12.8	<0.1	Negligible
HR_53	Section F	13.3	12.7	12.7	<0.1	Negligible
HR_54	Section F	14.3	13.5	13.6	<0.1	Negligible
HR_55	Section G	14.0	13.4	13.4	<0.1	Negligible
HR_56	Section G	14.8	14.2	14.2	<0.1	Negligible

Receptor ID	Project Section(s)	2023 Baseline (µg/m^3)	2030 DM (µg/m^3)	2030 DS (µg/m^3)	Magnitude of Change (µg/m^3)	Impact Descriptor
HR_57	Section H	13.4	13.0	13.0	<0.1	Negligible
HR_58	Section H	15.4	14.9	14.9	<0.1	Negligible
HR_59	Section H	15.4	14.9	15.0	<0.1	Negligible

Table A7.3.17 Air quality $PM_{2.5}$ human receptor results

Receptor ID	Project Section(s)	2023 Baseline (µg/m3)	2030 DM (µg/m3)	2030 DS (µg/m3)	Magnitude of Change (µg/m3)	Impact Descriptor
HR_1	Section A	6.0	5.4	5.4	<0.1	Negligible
HR_2	Section A	6.6	6.0	6.1	<0.1	Negligible
HR_3	Section A	5.9	5.4	5.4	<0.1	Negligible
HR_4	Section B	6.1	5.6	5.6	<0.1	Negligible
HR_5	Section B	5.9	5.4	5.4	<0.1	Negligible
HR_6	Section B	6.1	5.5	5.6	<0.1	Negligible
HR_7	Section B	6.0	5.5	5.5	<0.1	Negligible
HR_8	Section B	6.0	5.5	5.5	<0.1	Negligible
HR_9	Section B	7.3	6.7	6.7	<0.1	Negligible
HR_10	Section B	6.5	6.0	6.0	<0.1	Negligible
HR_11	Section B	6.5	6.0	6.0	<0.1	Negligible
HR_12	Section B	6.1	5.6	5.6	<0.1	Negligible
HR_13	Section B	7.4	6.9	6.9	<0.1	Negligible
HR_14	Section B	6.2	5.7	5.7	<0.1	Negligible
HR_15	Section B	6.7	6.2	6.2	<0.1	Negligible
HR_16	Section C	6.4	5.8	5.9	<0.1	Negligible
HR_17	Section C	7.9	7.3	7.3	0.1	Negligible
HR_18	Section C	7.6	7.1	7.1	<0.1	Negligible

Receptor ID	Project Section(s)	2023 Baseline (µg/m3)	2030 DM (µg/m3)	2030 DS (µg/m3)	Magnitude of Change (µg/m3)	Impact Descriptor
HR_19	Section C	7.4	6.8	6.9	<0.1	Negligible
HR_20	Section C	6.4	5.9	5.9	<0.1	Negligible
HR_21	Section C	7.0	6.5	6.5	<0.1	Negligible
HR_22	Section C	7.1	6.5	6.5	<0.1	Negligible
HR_23	Section C	7.3	6.7	6.7	<0.1	Negligible
HR_24	Section C	7.3	6.7	6.7	<0.1	Negligible
HR_25	Section C	6.6	6.1	6.1	<0.1	Negligible
HR_26	Section D	6.6	6.1	6.1	<0.1	Negligible
HR_27	Section D	6.5	6.0	6.0	<0.1	Negligible
HR_28	Section C	7.3	6.8	6.8	<0.1	Negligible
HR_29	Section C	6.6	6.1	6.1	<0.1	Negligible
HR_30	Section C	7.4	6.9	6.9	<0.1	Negligible
HR_31	Section C	6.5	5.9	6.0	<0.1	Negligible
HR_32	Section D	7.5	6.9	6.9	<0.1	Negligible
HR_33	Section D	7.5	6.9	6.9	<0.1	Negligible
HR_34	Section D	7.0	6.5	6.5	<0.1	Negligible
HR_35	Section D	7.1	6.5	6.6	<0.1	Negligible
HR_36	Section D	6.7	6.2	6.2	<0.1	Negligible
HR_37	Section D	6.8	6.3	6.3	<0.1	Negligible

Receptor ID	Project Section(s)	2023 Baseline (µg/m3)	2030 DM (µg/m3)	2030 DS (µg/m3)	Magnitude of Change (µg/m3)	Impact Descriptor
HR_38	Section D	8.2	7.6	7.6	<0.1	Negligible
HR_39	Section D	7.6	7.0	7.0	<0.1	Negligible
HR_40	Section D	8.0	7.4	7.4	<0.1	Negligible
HR_41	Section D	6.6	6.1	6.1	<0.1	Negligible
HR_42	Section D	6.5	6.0	6.0	<0.1	Negligible
HR_43	Section D	7.8	7.3	7.3	<0.1	Negligible
HR_44	Section D	6.8	6.3	6.3	<0.1	Negligible
HR_45	Section E	7.4	6.8	6.8	<0.1	Negligible
HR_46	Section E	7.4	6.8	6.8	<0.1	Negligible
HR_47	Section E	6.5	6.0	6.0	<0.1	Negligible
HR_48	Section E	6.9	6.4	6.4	<0.1	Negligible
HR_49	Section E	6.9	6.4	6.4	<0.1	Negligible
HR_50	Section F	6.6	6.1	6.1	<0.1	Negligible
HR_51	Section F	6.9	6.4	6.4	<0.1	Negligible
HR_52	Section F	8.0	7.4	7.4	<0.1	Negligible
HR_53	Section F	6.7	6.2	6.2	<0.1	Negligible
HR_54	Section F	8.1	7.5	7.5	<0.1	Negligible
HR_55	Section G	7.8	7.2	7.2	<0.1	Negligible
HR_56	Section G	8.0	7.4	7.4	<0.1	Negligible

Receptor ID	Project Section(s)	2023 Baseline (µg/m3)	2030 DM (µg/m3)	2030 DS (µg/m3)	Magnitude of Change (µg/m3)	Impact Descriptor
HR_57	Section H	7.5	7.1	7.1	<0.1	Negligible
HR_58	Section H	8.0	7.5	7.5	<0.1	Negligible
HR_59	Section H	8.0	7.5	7.5	<0.1	Negligible

Ecological Receptors

7.4.19 The annual mean NOx concentrations predicted at the 42 sensitive ecological receptors are presented in Table A7.3.19. For NOx annual mean, the highest concentration was recorded at receptor ER_13 (Millers Wood) and was 0.45 µg/m^3, which is below the critical level of 30 ug/m^3.

7.4.20 For Ammonia (NH_3) annual mean, the highest concentration was recorded at receptor ER_4 (Broad Border 3) and was 0.12 µg/m^3, which is below the critical level of 3 µg/m^3.

7.4.21 For nitrogen deposition, the assessment has considered contributions from both NOx and NH_3. The nitrogen deposition rates for the 42 sensitive ecological receptors are detailed in Table A7.3.20.

7.4.22 The assessment of construction effects at designated habitats identified 20 ecological receptors (ancient woodland and Local Nature Reserves) where the process contribution (PC) is greater than 1% of the critical load, as demonstrated in Table A7.3.20. Where results exceed 1% of the critical load, these have been considered further by ecologists[2], and detailed further below.

7.4.23 The baseline and estimated increase in Nitrogen levels for 13 of the 20 identified receptors was below the minimum critical load per ha per year, resulting in **no potential for a significant effect** on the habitats or species supported by these receptors.

7.4.24 The remaining seven ecological receptors (in Table A7.3.18 below) have been identified with Nitrogen levels that fall either within or above the critical load range defined by Air Pollution Information System (APIS) (UK Air Pollution Information System, 2016).

Table A7.3.18 Nitrogen modelling at ecological receptors

Receptor ID	Name	Designation	N Critical Load Min to Max (kg N/ha/yr)	Total N Dry Dep (N + NH_3) (kg N/ha/yr)	Total N Dry Dep (N + NH_3) (kg N/ha/yr)
ER_4	Broad Border 3	Ancient woodland	10-15	9.2	10.2
ER_16	Bentley Long Wood	Ancient woodland	10-15	12.5	13.2
ER_17	Birch Wood	Ancient woodland	10-15	11.2	11.9
ER_19	Walls Wood 2	Ancient woodland	10-15	15.5	15.9
ER_37	Round Shaw	Ancient woodland	10-15	15.6	15.7
ER_38	Warley Hall Wood	Ancient woodland	10-15	22.6	22.8

[2] The 1% threshold has become widely used throughout the air quality assessment profession to define a reasonable quantum of long-term pollution which is not likely to be discernible from fluctuations in background/measurements. For example, for many habitats, 1% of the critical load for nitrogen deposition equates to a very small change of less than 0.1 kgN/ha/yr, well within the expected normal variation in deposition. Its use has not been challenged by the courts, but it should be used in the context of an in-combination assessment.

Receptor ID	Name	Designation	N Critical Load Min to Max (kg N/ha/yr)	Total N Dry Dep (N + NH_3) (kg N/ha/yr)	Total N Dry Dep (N + NH_3) (kg N/ha/yr)
ER_39	Brickbarn Wood	Ancient woodland	10-15	13.4	13.5

7.4.25 The baseline levels of nitrogen associated with these 7 receptors was already elevated due to their location adjacent to main trunk roads (namely the A12, A13, A14, A120 and A127). The small increase in nitrogen levels resulting from the Project during construction is not expected to have a significant effect on these receptors as the construction impact would be experienced for a maximum of four years.

7.4.26 Overall, **no significant residual effect** is likely to be experienced by the identified sensitive ecological sites as a result of the minor increase in nitrogen levels that would be caused by the Project.

Table A7.3.19 Oxides of nitrogen (NOx) concentrations for ecological results

Receptor ID	Project Section(s)	X	Y	Critical Load (CL) (kg N/ha/yr)	2030 DM Total NO_x ($\mu g/m^3$)	2030 DS Total NO_x ($\mu g/m^3$)	Change in NO_x Concentration ($\mu g/m^3$)
ER_1	Section B	611455	277462	10	0.4	0.5	<0.1
ER_2	Section B	602580	275032	10	0.7	0.7	<0.1
ER_3	Section B	601869	261708	10	3.7	4.0	0.2
ER_4	Section B	600018	261507	10	9.7	10.4	0.4
ER_5	Section B	600606	261403	10	1.4	1.5	0.1
ER_6	Section B	611708	258496	10	5.0	5.1	0.1
ER_7	Section B	608923	256769	10	5.8	6.2	0.2
ER_8	Section B	609627	255855	Geological feature therefore no nutrient nitrogen critical loads and levels available.	2.2	2.4	0.1
ER_9	Section B	609674	255510	Geological feature therefore no nutrient nitrogen critical loads and levels available.	8.7	9.3	0.3
ER_10	Section B	609720	255311	Geological feature therefore no nutrient nitrogen critical loads and levels available.	4.6	4.9	0.2
ER_11	Section B	605674	250050	15	0.3	0.3	<0.1
ER_12	Section B	608416	247709	10	0.3	0.4	<0.1
ER_13	Section B	610677	246214	10	0.6	1.4	0.4
ER_14	Section B	610134	245924	10	0.5	1.1	0.3

Receptor ID	Project Section(s)	X	Y	Critical Load (CL) (kg N/ha/yr)	2030 DM Total NO_X ($\mu g/m^3$)	2030 DS Total NO_X ($\mu g/m^3$)	Change in NO_X Concentration ($\mu g/m^3$)
ER_15	Section C	611249	239910	10	3.5	3.6	0.1
ER_16	Section C	610389	239068	10	13.9	14.5	0.3
ER_17	Section C	602829	230354	10	12.2	13.0	0.4
ER_18	Section D	601662	229221	10	6.7	7.0	0.2
ER_19	Section C	603827	227540	10	17.6	18.0	0.2
ER_20	Section C	603829	227503	10	10.2	10.5	0.1
ER_21	Section C	607555	225770	10	2.2	2.3	<0.1
ER_22	Section D	591439	223826	No nutrient nitrogen critical loads and levels available.	2.9	2.9	<0.1
ER_23	Section E	577967	223478	10	1.8	1.8	<0.1
ER_24	Section E	578151	223155	10	2.3	2.4	<0.1
ER_25	Section E	571737	222171	10	10.0	10.3	0.2
ER_26	Section E	573512	221100	10	9.2	9.5	0.2
ER_27	Section E	579387	219510	10	3.2	3.2	<0.1
ER_28	Section F	573512	218747	10	1.9	1.9	<0.1
ER_29	Section E	576005	217567	10	0.3	0.4	0.1
ER_30	Section F	571259	213847	10	3.3	3.5	0.1
ER_31	Section F	565274	205512	10	0.5	0.5	<0.1
ER_32	Section F	565889	202346	10	0.4	0.4	<0.1
ER_33	Section F	566111	201178	10	6.8	6.9	0.1

Receptor ID	Project Section(s)	X	Y	Critical Load (CL) (kg N/ha/yr)	2030 DM Total NO_X ($\mu g/m^3$)	2030 DS Total NO_X ($\mu g/m^3$)	Change in NO_X Concentration ($\mu g/m^3$)
ER_34	Section G	564925	189679	10	23.1	23.2	<0.1
ER_35	Section G	564520	189606	10	17.8	17.9	<0.1
ER_36	Section G	562996	189493	15	2.5	2.5	<0.1
ER_37	Section G	562786	189225	10	17.9	18.1	0.1
ER_38	Section G	560148	188760	10	26.3	26.4	0.1
ER_39	Section H	558659	179908	10	12.2	12.3	0.1
ER_40	Section D	598622	230639	10	0.5	0.6	<0.1
ER_41	Section D	590602	224645	10	0.5	0.6	0.1
ER_42	Section H	566322	180066	10	0.6	0.7	<0.1

Table A7.3.20 Nitrogen deposition (N dep) rates for ecological results

Receptor ID	Project Section(s)	2030 DM total N Dep (kg N/ha/yr)	2030 DS total N Dep (kg N/ha/yr)	Critical Load (CL) (kg N/ha/yr)	Total N Dep (kg N/ha/yr)	DM-DS	% Change to CL
ER_1	Section B	19.8	19.8	10	19.5	0.0	0.2%
ER_2	Section B	38.1	38.2	10	37.4	0.0	0.4%
ER_3	Section B	37.0	37.4	10	33.9	0.4	3.8%
ER_4	Section B	42.4	43.4	10	34.2	1.0	10.0%
ER_5	Section B	34.5	34.7	10	33.3	0.1	1.4%
ER_6	Section B	37.4	37.5	10	33.7	0.1	1.3%
ER_7	Section B	37.9	38.4	10	32.9	0.5	4.9%

Receptor ID	Project Section(s)	2030 DM total N Dep (kg N/ha/yr)	2030 DS total N Dep (kg N/ha/yr)	Critical Load (CL) (kg N/ha/yr)	Total N Dep (kg N/ha/yr)	DM-DS	% Change to CL
ER_8	Section B	Geological feature therefore no nutrient nitrogen critical loads and levels available.					
ER_9	Section B	Geological feature therefore no nutrient nitrogen critical loads and levels available.					
ER_10	Section B	Geological feature therefore no nutrient nitrogen critical loads and levels available.					
ER_11	Section B	15.0	15.0	15	14.9	0.0	0.2%
ER_12	Section B	27.5	27.6	10	27.3	0.0	0.4%
ER_13	Section B	27.7	28.3	10	27.8	0.6	6.2%
ER_14	Section B	27.4	27.8	10	27.4	0.5	4.7%
ER_15	Section C	28.4	28.6	10	25.4	0.2	1.9%
ER_16	Section C	37.8	38.6	10	26.0	0.7	7.4%
ER_17	Section C	36.5	37.2	10	26.0	0.7	6.8%
ER_18	Section D	31.5	31.8	10	25.7	0.3	2.7%
ER_19	Section C	40.4	40.8	10	25.3	0.4	3.8%
ER_20	Section C	33.9	34.2	10	25.1	0.2	2.3%
ER_21	Section C	26.2	26.2	10	24.2	0.1	0.6%
ER_22	Section D	No nutrient nitrogen critical loads and levels available.					
ER_23	Section E	14.8	14.8	10	13.8	0.0	0.3%
ER_24	Section E	28.4	28.4	10	26.4	0.0	0.4%
ER_25	Section E	34.9	35.3	10	26.7	0.4	4.0%
ER_26	Section E	35.7	36.1	10	26.9	0.4	4.0%
ER_27	Section E	29.7	29.7	10	26.2	0.1	0.5%

Receptor ID	Project Section(s)	2030 DM total N Dep (kg N/ha/yr)	2030 DS total N Dep (kg N/ha/yr)	Critical Load (CL) (kg N/ha/yr)	Total N Dep (kg N/ha/yr)	DM-DS	% Change to CL
ER_28	Section F	28.4	28.5	10	26.6	0.1	0.9%
ER_29	Section E	26.8	26.9	10	26.6	0.1	0.8%
ER_30	Section F	31.0	31.1	10	26.7	0.1	1.1%
ER_31	Section F	25.8	25.8	10	25.3	0.0	0.2%
ER_32	Section F	25.3	25.3	10	24.9	0.0	0.1%
ER_33	Section F	30.7	30.8	10	24.8	0.1	1.0%
ER_34	Section G	43.9	44.0	10	24.0	0.1	0.6%
ER_35	Section G	39.4	39.4	10	24.0	0.1	0.5%
ER_36	Section G	25.5	25.5	15	23.3	0.0	0.1%
ER_37	Section G	38.9	39.0	10	23.5	0.1	1.3%
ER_38	Section G	45.8	46.0	10	23.3	0.2	1.8%
ER_39	Section H	36.6	36.7	10	23.4	0.1	1.2%
ER_40	Section D	26.6	26.6	10	26.6	0.0	0.4%
ER_41	Section D	26.6	26.6	10	26.6	0.1	0.7%
ER_42	Section H	24.5	24.5	10	24.5	0.0	0.2%

Air Quality Summary

7.4.27 The assessment has examined the potential impacts of the Project on local air quality during the modelled year 2030.

7.4.28 A review of the current air quality legislation and planning policies relevant to the Project has been undertaken. The assessment covers each of the main areas highlighted as being essential for an air quality assessment in the National Policy Statement for National Networks (NPSNN) (Department for Transport, 2014).

7.4.29 The baseline assessment demonstrates that there are existing air quality issues in the Order Limits, with no exceedances of the NO_2 annual mean standard observed in 2023.

7.4.30 Operation of the Project is not considered to result in a significant effect to human health in the Order Limits. There were no exceedances of the standards for NO_2, PM_{10} and $PM_{2.5}$ in the modelled year 2030.

7.4.31 The assessment of construction phase impacts shows that there are sites where the predicted PC is greater than 1% of the critical load at several designated habitats. Where results exceed the screening criteria, these have been considered further by an ecologist and concluded no significant effects are likely to be experienced as a result on increased nitrogen levels that would be caused by the Project. The results of the construction phase impact assessment on designated habitat sites were considered to be **not significant.**

7.4.32 Therefore, the Project is not likely to result in any significant adverse effects that would require additional mitigation to ensure no impacts for air quality.

7.4.33 A summary of the air quality results is provided in Table A7.3.21.

Table A7.3.21 Summary of Air Quality results

Impact	Magnitude	Receptor Sensitivity	Embedded/Standard Mitigation	Description of effect and Likely Significance
Construction dust (worst-case) Dust soiling - High Human health - Low Ecological - Medium	Overall Risk: High	The full measures are included within the Outline CoCP (document reference 7.2).	Standard Mitigation Outlined in Section 7.6 of Chapter 7 and Table 6.1 of the Outline CoCP (document reference 7.2)	**Not significant after standard mitigation**
Human health	Negligible	High for receptors within 200 m of the Affected	None	**Not significant**

Impact	Magnitude	Receptor Sensitivity	Embedded/Standard Mitigation	Description of effect and Likely Significance
		Road Network (ARN)		
Ecological receptors	Negligible where the PC does not exceed 1% of the critical level. Where the PC exceeds 1% of the critical level, these have been considered further in the ecology impact assessment in Chapter 8.	High for receptors within 200 m of the ARN	None	**Not significant**

Abbreviations

Abbreviation	Full Reference
APIS	Air Pollution Information System
ARN	Affected Road Network
CoCP	Code of Construction Practice
DCO	Development Consent Order
DM	Do Minimum
DS	Do Something
EACN	East Anglia Connection Node
EPUK	Environmental Protection UK
ES	Environmental Statement
GIS	Gas Insulated Switchgear
HDV	Heavy-Duty Vehicles
IAQM	Institute of Air Quality Management
LAQM	Local Air Quality Management Technical Guidance
LNR	Local Nature Reserve
NH_3	Ammonia
NRMM	Non-Road Mobile Machinery
NO_2	Nitrogen Dioxide
NOx	Nitrogen Oxide
NPSNN	National Policy Statement for National Networks
MEWP	Mobile Elevated Work Platforms
PC	Process Contribution
$PM_{2.5}$	Particulate Matter (2.5 micrometers or less in diameter)
PM_{10}	Particulate Matter (10 micrometers or less in diameter)
SSSI	Site of Special Scientific Interest
$\mu g/m^3$	Micrograms per cubic meter

Glossary

Term	Definition
Annual mean	The average (mean) of the concentrations measured for each pollutant for one year.
Critical level	The quantity of pollutant deposited from air to the ground.
Critical load	The gaseous concentration of a pollutant in the air.
Do Minimum scenario	The future construction year (2030) traffic flows without the construction of the Project (using 2030 emissions).
Do Something scenario	The future construction year (2030) traffic flows and the construction traffic flows generated by the construction of the Project (2030 emissions).
Trackout	The transport of dust and dirt from the construction/demolition site onto the public road network, where it may be deposited and then re-suspended by vehicles using the network.

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