In Parliament – Session 2022 - 2023

HS2

High Speed Rail (Crewe – Manchester)

Supplementary Environmental Statement 2 and Additional Provision 2 Environmental Statement

Volume 5: Appendix AQ-001-0MA02

Air quality

Air quality report

MA02: Wimboldsley to Lostock Gralam

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Department for Transport

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1 Introduction

1.1 Structure of this appendix

1.1.1 This report is an appendix to the air quality assessment which forms part of Volume 5 of the Supplementary Environmental Statement 2 (SES2) and Additional Provision 2 Environmental Statement (AP2 ES) for the Wimboldsley to Lostock Gralam (MA02) community area.

1.1.2 This appendix provides details of changes to the air quality assessment since the High Speed Two (HS2) High Speed Rail (Crewe – Manchester) Environmental Statement (ES) published in 2022[1] (the main ES), and the Supplementary Environmental Statement 1 (SES1) and Additional Provision 1 Environmental Statement (AP1 ES) also published in 2022[2].

1.1.3 This report should be read in conjunction with the main ES Volume 5, Appendix: AQ-001-0MA02 and SES1 and AP1 ES Volume 5, Appendix: AQ-001-0MA02.

1.1.4 In order to differentiate between the original scheme and the subsequent changes, the following terms are used:

- 'the original scheme' – the Bill scheme submitted to Parliament in 2022, which was assessed in the main ES;
- 'the SES1 scheme' – the original scheme with any changes described in SES1 that are within the existing powers of the Bill;
- 'the AP1 revised scheme' – the original scheme as amended by SES1 changes and AP1 amendments;
- 'the SES2 scheme' – the original scheme with any changes described in SES1 (submitted in July 2022) and the SES2; and
- 'the AP2 revised scheme' – the original scheme as amended by SES1 and SES2 changes (as relevant) and AP2 amendments.

1.1.5 Maps referred to in this appendix are contained in the SES2 and AP2 ES Volume 5, Air quality Map Book: Map Series AQ-01- Monitoring Locations and Receptors.

[1] High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Environmental Statement.* Available online at: https://www.gov.uk/government/collections/hs2-phase2b-crewe-manchester-environmental-statement.

[2] High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement*. Available online at: https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-supplementary-environmental-statement-1-and-additional-provision-1-environmental-statement.

1.1.6 In addition, the traffic data used for the air quality assessment is set out in Background Information and Data (BID)[3] which accompanies the SES2 and AP2 ES (see BID AQ-002-0MA02 SES2 and AP2 ES).

1.1.7 Where it has been possible to differentiate the air quality assessment between the SES2 changes and the AP2 amendments, this has been done and presented in this report. However, the assessment of road traffic emissions is a combined assessment of both SES2 changes and AP2 amendments in this area.

1.2 Scope, methodology, data sources, assumptions and limitations

1.2.1 The assessment scope, key assumptions and limitations are as set out in the main ES Environmental Impact Assessment Scope and Methodology Report (SMR)[4] (see main ES Volume 5: Appendix CT-001-00001).

1.2.2 Since the preparation of the main ES, the Department for Environment, Food and Rural Affairs (Defra) has released new versions of tools for undertaking air quality assessments[5], namely the emissions factors toolkit. This air quality assessment has therefore used the latest available tools.

1.2.3 The air quality standards for this assessment are:

- 40µg/m^3 as an annual mean for nitrogen dioxide (NO_2) and fine particulate matter (PM_{10});
- 200µg/m^3 one-hour mean NO_2 concentrations, not to be exceeded more than 18 times a year (equivalent to the 99.8th percentile of the one-hour mean);
- 50µg/m^3 24-hour mean PM_{10} concentrations, not to be exceeded more than 35 times a year (equivalent to the 90.4th percentile of the 24-hour mean); and
- 20µg/m^3 as an annual mean for very fine particulate matter ($PM_{2.5}$).

[3] High Speed Two Ltd (2023), High Speed Rail (Crewe – Manchester), *Background Information and Data accompanying Supplementary Environmental Statement 2 and Additional Provision 2 Environmental Statement, Additional data used in the air quality assessment,* BID AQ-002-0MA01 SES2 and AP2 ES. Available online at: https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-supplementary-environmental-statement-2-and-additional-provision-2-environmental-statement.

[4] High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Environmental Statement, Environmental Impact Assessment Scope and Methodology Report,* Volume 5, Appendix: CT-001-00001. Available online at: https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-environmental-statement.

[5] Department for Environment, Food and Rural Affairs (2022). *Local air quality management.* Available online at: https://laqm.defra.gov.uk/whatsnew.html.

2 Baseline air quality data

2.1 Existing air quality

Background pollutant concentrations

2.1.1 Estimates of background air quality were obtained from the Defra maps[6]. Background pollutant concentrations are within the air quality standards throughout the study area. Table 1 presents the range of background pollutant concentrations within the Wimboldsley to Lostock Gralam (MA02) community area for the future baseline. The 2018 background pollutant concentrations remain the same as the main ES.

2.1.2 Background pollutant concentrations for the operational year of 2039 have been taken from the Defra background maps for 2030, which is the latest available year of data. The 2030 background maps have been used as representative of the future baseline conditions during operation of the AP2 revised scheme.

Table 1: Range of background pollutant concentrations

Pollutant	Background concentrations (µg/m^3)	
	2026	2039
Annual mean NOx	6.7µg/m^3 to 13.6µg/m^3	6.3µg/m^3 to 12.7µg/m^3
Annual mean NO_2	5.3µg/m^3 to 10.3µg/m^3	5.0µg/m^3 to 9.7µg/m^3
Annual mean PM_{10}	8.8µg/m^3 to 12.0µg/m^3	8.7µg/m^3 to 12.0µg/m^3
Annual mean $PM_{2.5}$	5.7µg/m^3 to 7.9µg/m^3	5.6µg/m^3 to 7.8µg/m^3

[6] Department for Environment, Food and Rural Affairs (Defra) (2018), D*efra Background Pollutant Concentration Maps*. Available online at: https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018.

3 Construction dust assessment

3.1 Introduction

3.1.1 This section provides details of the assessment of dust emissions during construction of the AP2 revised scheme. The assessment is provided separately for each proposed amendment to the design, where it has been identified that the amendment has the potential to change the risk of dust soiling, human health effects or ecological effects compared to the main ES as amended by SES1 and AP1 ES. A summary is then provided of the overall risk from construction dust in the Wimboldsley to Lostock Gralam (MA02) community area, and how it has changed from that reported in the main ES.

3.2 Additional land temporarily required for modifications to the A54 St Michael's Way, A533 Leadsmithy Street and A54 Kinderton Street junction (AP2-002-001)

Dust soiling and human health effects

3.2.1 There are no changes to the air quality reported information in the SES1 and AP1 ES for these junction modifications (AP2-002-001) for dust soiling and human health effects during construction of the AP2 revised scheme.

Ecological effects

Assessed receptors and sensitivity of the area

3.2.2 An assessment of ecological effects has been undertaken for the following ecological receptors that are affected by these junction modifications (AP2-002-001), from south to north:

- Shropshire Union Canal (Middlewich Branch) Local Wildlife Site (LWS)/Site of Biological Importance (SBI), Weaver Bank Ancient Woodland (AW)/LWS, Wimboldsley Wood Site of Special Scientific Interest (SSSI)/LWS/AW and Rookery/Small Rookery Woods LWS/AW/SBI: there are no demolition or trackout activities in this area. These ecological sites are located within 20m of earthworks and construction activities;
- Wimboldsley Woodland near Lea Hall LWS, Stanthorne Hall Farm AW, Whatcroft Lane Pond LWS/SBI and Frank Morris's Wood LWS: These ecological sites are located within 50m of demolition activities and within 20m of earthworks, construction and trackout activities;

- River Dane, Bostock LWS, Bostock Road Orchards LWS, The Willowbeds LWS/SBI, Greenhays Farm Pasture and Woodland LWS/SBI, Veteran Ash Tree, Bank Farm, Bostock LWS: there are no demolition activities in this area. These ecological sites are located within 20m of earthworks, construction and trackout activities; and
- Veteran Ash Tree, Bank Hall Farm LWS, Flint Mill Reedbeds LWS, Bull's Wood and Meadow LWS/AW, Bank Hall Farm Flush LWS and Oak Clump AW: there are no demolition activities in this area. These ecological sites are located within 20m of earthworks, construction and trackout activities.

3.2.3 Table 2 presents the sensitivity of each area to ecological effects.

Table 2: Sensitivity of area to ecological effects

Area	Demolition	Earthworks	Construction	Trackout
Shropshire Union Canal (Middlewich Branch) LWS/SBI, Weaver Bank AW/LWS, Wimboldsley Wood SSSI/LWS/AW and Rookery/Small Rookery Woods LWS/AW/SBI	Not applicable	High	High	Not applicable
Wimboldsley Woodland near Lea Hall LWS, Stanthorne Hall Farm AW, Whatcroft Lane Pond LWS/SBI and Frank Morris's Wood LWS	Low	Medium	Medium	Medium
River Dane, Bostock LWS, Bostock Road Orchards LWS, The Willowbeds LWS/SBI, Greenhays Farm Pasture and Woodland LWS/SBI, Veteran Ash Tree, Bank Farm, Bostock LWS	Not applicable	Low	Low	Low
Veteran Ash Tree, Bank Hall Farm LWS, Flint Mill Reedbeds LWS, Bull's Wood and Meadow LWS/AW, Bank Hall Farm Flush LWS and Oak Clump AW	Not applicable	Medium	Medium	Medium

Dust emission magnitude

3.2.4 Each dust generating activity has been assigned a dust emission magnitude as shown in Table 3.

Table 3: Dust emission magnitude for ecological effects

Area	Demolition	Earthworks	Construction	Trackout
Shropshire Union Canal (Middlewich Branch) LWS/SBI, Weaver Bank AW/LWS, Wimboldsley Wood SSSI/LWS/AW and Rookery/Small Rookery Woods LWS/AW/SBI	Not applicable	Large	Large	Not applicable
Wimboldsley Woodland near Lea Hall LWS, Stanthorne Hall Farm AW, Whatcroft Lane Pond LWS/SBI and Frank Morris's Wood LWS	Small	Large	Large	Large

Area	Demolition	Earthworks	Construction	Trackout
River Dane, Bostock LWS, Bostock Road Orchards LWS, The Willowbeds LWS/SBI, Greenhays Farm Pasture and Woodland LWS/SBI, Veteran Ash Tree, Bank Farm, Bostock LWS	Not applicable	Large	Large	Large
Veteran Ash Tree, Bank Hall Farm LWS, Flint Mill Reedbeds LWS, Bull's Wood and Meadow LWS/AW, Bank Hall Farm Flush LWS and Oak Clump AW	Not applicable	Large	Large	Large

Risk of impacts

3.2.5 Taking into consideration the dust emission magnitude of each activity and the sensitivity of the area, the risk of dust effects has been defined as shown in Table 4.

Table 4: Risk of ecological effects

Area	Demolition	Earthworks	Construction	Trackout
Shropshire Union Canal (Middlewich Branch) LWS/SBI, Weaver Bank AW/LWS, Wimboldsley Wood SSSI/LWS/AW and Rookery/Small Rookery Woods LWS/AW/SBI	Not applicable	High risk	High risk	Not applicable
Wimboldsley Woodland near Lea Hall LWS, Stanthorne Hall Farm AW, Whatcroft Lane Pond LWS/SBI and Frank Morris's Wood LWS	Negligible risk	Medium risk	Medium risk	Medium risk
River Dane, Bostock LWS, Bostock Road Orchards LWS, The Willowbeds LWS/SBI, Greenhays Farm Pasture and Woodland LWS/SBI, Veteran Ash Tree, Bank Farm, Bostock LWS	Not applicable	Low risk	Low risk	Low risk
Veteran Ash Tree, Bank Hall Farm LWS, Flint Mill Reedbeds LWS, Bull's Wood and Meadow LWS/AW, Bank Hall Farm Flush LWS and Oak Clump AW	Not applicable	Medium risk	Medium risk	Medium risk

3.3 Additional land temporarily required for modifications to the A530 King Street, A530 Croxton Lane and B5309 King Street junction (AP2-002-002)

Dust soiling and human health effects

Assessed receptors and sensitivity of the area

3.3.1 The assessment of dust soiling and human health effects has been undertaken for the area around Whatcroft that is affected by these junction modifications (AP2-002-002). Residential dwellings are located within 200m of demolition, and 20m of earthworks, construction and trackout[7] activities.

3.3.2 The sensitivity of the area to dust soiling and human health effects has been defined as shown in Table 5.

Table 5: Sensitivity of area to dust soiling and human health effects

Effect	Demolition	Earthworks	Construction	Trackout
Area around Whatcroft				
Dust soiling	Low	High	High	Medium
Human health	Low	Low	Low	Low

Dust emission magnitude

3.3.3 Each dust generating activity has been assigned a dust emission magnitude as shown in Table 6.

Table 6: Dust emission magnitude for dust soiling and human health effects

Area	Demolition	Earthworks	Construction	Trackout
Area around Whatcroft	Medium	Large	Large	Large

Risk of impacts

3.3.4 Taking into consideration the dust emission magnitude of each activity and the sensitivity of the area, the risk of dust effects has been defined as shown in Table 7.

[7] Trackout refers to the transport of dust and dirt from the construction site(s) onto the public road network, where it may be deposited and then re-suspended by vehicles using the network.

Table 7: Risk of dust soiling and human health effects

Effect	Demolition	Earthworks	Construction	Trackout
Area around Whatcroft				
Dust soiling	Low risk	High risk	High risk	Medium risk
Human health	Low risk	Low risk	Low risk	Low risk

Ecological effects

Assessed receptors and sensitivity of the area

3.3.5 An assessment of ecological effects has been undertaken for the following ecological receptors that are affected by these junction modifications (AP2-002-002), from south to north:

- Trent and Mersey Canal, Whatcroft LWS, Puddinglake Brook Wood LWS, Whatcroft Hedge LWS, Whatcroft Lane Wetlands LWS and Meadow by Trent and Mersey Canal LWS/SBI: there are no demolition activities in this area. These ecological sites are located within 20m of earthworks, construction and trackout activities; and
- Ash Trees along Trent and Mersey Canal, Billinge Green LWS, Billinge Green Farm Pond SBI/LWS and Pear Tree Farm LWS: there are no demolition activities in this area. These ecological sites are located within 20m of earthworks, construction and trackout activities.

3.3.6 The sensitivity of the area to ecological effects is defined as low for all dust generating activities.

Dust emission magnitude

3.3.7 Each dust generating activity has been assigned a dust emission magnitude as shown in Table 8.

Table 8: Dust emission magnitude for ecological effects

Area	Demolition	Earthworks	Construction	Trackout
Trent and Mersey Canal, Whatcroft LWS, Puddinglake Brook Wood LWS, Whatcroft Hedge LWS, Whatcroft Lane Wetlands LWS and Meadow by Trent and Mersey Canal LWS/SBI	Not applicable	Large	Large	Large
Ash Trees along Trent and Mersey Canal, Billinge Green LWS, Billinge Green Farm Pond SBI/LWS and Pear Tree Farm LWS	Not applicable	Large	Large	Large

Risk of impacts

3.3.8 Taking into consideration the dust emission magnitude of each activity and the sensitivity of the area, the risk of dust effects has been defined as shown in Table 9.

Table 9: Risk of ecological effects

Area	Demolition	Earthworks	Construction	Trackout
Trent and Mersey Canal, Whatcroft LWS, Puddinglake Brook Wood LWS, Whatcroft Hedge LWS, Whatcroft Lane Wetlands LWS and Meadow by Trent and Mersey Canal LWS/SBI	Not applicable	Low risk	Low risk	Low risk
Ash Trees along Trent and Mersey Canal, Billinge Green LWS, Billinge Green Farm Pond SBI/LWS and Pear Tree Farm LWS	Not applicable	Low risk	Low risk	Low risk

3.4 Additional land permanently required for modifications to the A559 Manchester Road, A559 Hall Lane, and Station Road junction (AP2-002-003)

Dust soiling and human health effects

3.4.1 There are no changes to the air quality reported information in the SES1 and AP1 ES for these junction modifications (AP2-002-003) for dust soiling and human health effects during construction of the AP2 revised scheme.

Ecological effects

Assessed receptors and sensitivity of the area

3.4.2 An assessment of ecological effects has been undertaken for ecological receptors Wade Brook LWS, Long Wood, Lostock LWS/SBI, Plumley Lime Beds SSSI and Wincham Brook Valley and Mill Wood LWS that are affected by this design element. There are no demolition activities in this area. These ecological sites are located within 20m of earthworks, construction and trackout activities.

3.4.3 The sensitivity of the area to ecological effects is defined as high for all dust generating activities.

Dust emission magnitude

3.4.4 Each dust generating activity has been assigned a dust emission magnitude as shown in Table 10.

Table 10: Dust emission magnitude for ecological effects

Area	Demolition	Earthworks	Construction	Trackout
Wade Brook LWS, Long Wood, Lostock LWS/SBI, Plumley Lime beds SSSI and Wincham Brook Valley and Mill Wood LWS	Not applicable	Large	Large	Large

Risk of impacts

3.4.5 Taking into consideration the dust emission magnitude of each activity and the sensitivity of the area, the risk of dust effects has been defined as shown in Table 11.

Table 11: Risk of ecological effects

Area	Demolition	Earthworks	Construction	Trackout
Wade Brook LWS, Long Wood, Lostock LWS/SBI, Plumley Lime beds SSSI and Wincham Brook Valley and Mill Wood LWS	Not applicable	High risk	High risk	High risk

3.5 Additional land temporarily required for modifications to the A559 Manchester Road and Stubbs Lane junction (AP2-002-005)

Dust soiling and human health effects

3.5.1 There are no changes to the air quality reported information in the SES1 and AP1 ES for these junction modifications (AP2-002-005) for dust soiling and human health effects during construction of the AP2 revised scheme.

Ecological effects

Assessed receptors and sensitivity of the area

3.5.2 An assessment of ecological effects has been undertaken for ecological receptors in the area around Mill Wood and Mill Bottoms LWS/SBI, Winnington and Peas Wood LWS/SBI/AW and Leonards and Smoker Wood LWS/SBI/AW that are affected by this design element. There are no demolition activities in this area. These ecological sites are located within 20m of earthworks, construction and trackout activities.

3.5.3 The sensitivity of the area to ecological effects is defined as medium for all dust generating activities.

Dust emission magnitude

3.5.4 Each dust generating activity has been assigned a dust emission magnitude as shown in Table 12.

Table 12: Dust emission magnitude for ecological effects

Area	Demolition	Earthworks	Construction	Trackout
Mill Wood and Mill Bottoms LWS/SBI, Winnington and Peas Wood LWS/SBI/AW and Leonards and Smoker Wood LWS/SBI/AW	Not applicable	Large	Large	Large

Risk of impacts

3.5.5 Taking into consideration the dust emission magnitude of each activity and the sensitivity of the area, the risk of dust effects has been defined as shown in Table 13.

Table 13: Risk of ecological effects

Area	Demolition	Earthworks	Construction	Trackout
Mill Wood and Mill Bottoms LWS/SBI, Winnington and Peas Wood LWS/SBI/AW and Leonards and Smoker Wood LWS/SBI/AW	Not applicable	Medium risk	Medium risk	Medium risk

Summary of risks

3.5.6 This section summarises the risks for construction dust for the Wimboldsley to Lostock Gralam (MA02) community area. The risks identified for these design elements are summarised in Table 14. Table 15 summarises the new overall risk for the whole of the Wimboldsley to Lostock Gralam (MA02) community area.

3.5.7 Table 15 shows that the risk summary for the whole Wimboldsley to Lostock Gralam (MA02) community area is the same as that reported in the main ES as amended by SES1 and AP1 ES, and for the AP2 revised scheme, with the exception of the risks for all activities for ecological sites and for dust soiling from demolition. The risk for ecological effects from demolition changes from 'negligible to low' in the main ES as amended by SES1 and AP1 ES, to 'negligible' in the AP2 revised scheme. The risk for ecological effects from earthworks, construction and trackout activities changes from 'low to medium' in the main ES as amended by SES1 and AP1 ES, to 'low to high' in the AP2 revised scheme. The dust soiling risk from demolition changes from 'negligible to medium' in the main ES as amended by SES1 and AP1 ES to 'negligible to low' in the AP2 revised scheme. This assessment does not change the conclusion of the main ES as amended by SES1 with the proposed AP1 amendments if approved.

Table 14: Summary of risks for construction dust assessment accounting for the AP2 amendments (areas affected by the AP2 revised scheme)

Activity	Dust Soiling	Human Health	Ecological Effects
Demolition	Low	Low	Negligible
Earthworks	High	Low	Low to high
Construction	High	Low	Low to high
Trackout	Medium	Low	Low to high

Table 15: Summary of risks for construction dust assessment accounting for the AP2 amendments (Wimboldsley to Lostock Gralam (MA02) community area)

Activity	Dust Soiling	Human Health	Ecological Effects
Demolition	Negligible to low	Negligible to low	Negligible
Earthworks	High	Low to medium	Low to high
Construction	High	Low to medium	Low to high
Trackout	Medium to high	Low to medium	Low to high

4 Mineral dust assessment

4.1.1 There are no changes to the reported data in the main ES for any of the design elements for the assessment of mineral dust emissions during construction of the AP2 revised scheme.

5 Assessment of road traffic emissions

5.1 Overview

5.1.1 This section provides details of the assessment of road traffic emissions during construction of the AP2 revised scheme. The assessment considers the combined effects of SES2 changes and AP2 amendments in this area.

5.2 Model verification

5.2.1 Since the main ES, as amended by SES1 and AP1 ES, additional traffic information has been collected, as well as further information relating to local junction modelling. As a result of this, revised traffic data for the baseline year of 2018 and future baseline years for construction and operation has become available. The model verification has therefore been updated to take account of this revised baseline traffic data.

5.2.2 Model verification was undertaken on a route-wide basis where monitoring sites are located adjacent to the modelled road network. The objectives of the model verification are to evaluate model performance and to determine if model adjustment is required.

5.2.3 Some monitoring locations were not considered suitable for model verification, due to missing traffic or monitoring data, or other spatial considerations. A total of 23 monitoring sites, spread across both Hough to Walley's Green (MA01) and Wimboldsley to Lostock Gralam (MA02) community areas, were included in the model verification exercise. The comparison of monitored and modelled NO_2 concentrations is shown in Table 16.

Table 16: Comparison of monitored and modelled NO_2 concentrations

Site	Monitored concentration (µg/m³)	Modelled concentration (µg/m³)	Percent difference (modelled - monitored/monitored)
MA01.1[a]	28.0	14.0	-50.2%
MA01.2[a]	38.8	23.7	-39.0%
MA01.3[a]	31.5	18.9	-40.1%
MA01.8[a]	34.3	19.8	-42.3%
MA01.9[a]	32.7	22.0	-32.6%
MA01.15[a]	34.9	19.3	-44.7%
MA01.17[a]	26.9	16.8	-37.6%
MA01.18[a]	32.6	16.4	-49.7%
MA02.19[b]	28.2	16.6	-41.3%
MA02.20[b]	35.6	21.9	-38.3%
MA02.21 [b]	48.5	30.7	-36.8%
MA02.22[a]	25.4	17.2	-32.3%
MA02.23[a]	35.1	16.1	-54.3%
MA02.30[c]	39.5	18.9	-52.2%

Site	Monitored concentration (µg/m³)	Modelled concentration (µg/m³)	Percent difference (modelled - monitored/monitored)
MA02.33[a]	31.2	19.3	-38.2%
MA02.35[a]	36.7	18.2	-50.3%
MA02.41[b]	32.0	20.3	-36.4%
MA02.42[b]	38.0	21.1	-44.6%
MA02.43[a]	31.7	20.9	-34.1%
MA02.44[d]	21.3	21.4	0.3%
CE134[c]	34.4	17.2	-49.8%
CE270[c]	34.0	19.3	-43.4%
CE282[c]	41.9	20.8	-50.4%

Note: [a] denotes sites used to derive the adjustment factor for locations covered by the Crewe and Winsford transport models. [b] denotes sites used to derive the adjustment factor for locations covered by the Northwich transport model. [c] denotes sites used to derive the adjustment factor for locations along Lewin Street (Middlewich). [d] denotes sites used to derive the adjustment factor for locations along the M6.

5.2.4 As most of the modelled NO_2 concentrations were greater than ±25% of the monitored concentrations, and there was systematic under prediction, model adjustment was undertaken. Four adjustment factors were calculated: a factor of 1.0 for locations along the M6 motorway, a factor of 2.3 for locations covered by the Northwich transport model (which includes Moulton, Northwich, Lach Dennis, Lostock Gralam and Wincham); a factor of 2.6 for locations covered by the Crewe and Winsford transport models (which include Crewe, Middlewich, Winsford) and a factor of 3.9 for locations along Lewin Street (Middlewich). Modelled concentrations of PM_{10} and $PM_{2.5}$ have not been adjusted. The comparison of monitored and adjusted modelled NO_2 concentrations is shown in Table 17.

Table 17: Comparison of monitored and adjusted modelled NO_2 concentrations

Site	Monitored concentration (µg/m³)	Modelled adjusted concentration (µg/m³)	Percent difference (modelled - monitored/monitored)
MA01.1[a]	28.0	21.3	-24.1%
MA01.2[a]	38.8	45.1	16.3%
MA01.3[a]	31.5	29.6	-6.0%
MA01.8[a]	34.3	31.1	-9.2%
MA01.9[a]	32.7	36.4	11.3%
MA01.15[a]	34.9	30.6	-12.4%
MA01.17[a]	26.9	25.6	-5.0%
MA01.18[a]	32.6	24.5	-25.1%
MA02.19[b]	28.2	24.7	-12.3%
MA02.20[b]	35.6	35.7	0.3%
MA02.21[b]	48.5	51.7	6.6%
MA02.22[a]	25.4	26.2	2.9%
MA02.23[a]	35.1	27.3	-22.3%
MA02.30[c]	39.5	36.5	-7.4%

Site	Monitored concentration (µg/m³)	Modelled adjusted concentration (µg/m³)	Percent difference (modelled - monitored/monitored)
MA02.33[a]	31.2	33.1	6.2%
MA02.35[a]	36.7	30.7	-16.4%
MA02.41[b]	32.0	31.7	-0.9%
MA02.42[b]	38.0	32.6	-14.2%
MA02.43[a]	31.7	38.4	21.0%
MA02.44[d]	21.3	21.4	0.3%
CE134[c]	34.4	31.1	-9.4%
CE270[c]	34.0	38.0	11.5%
CE282[c]	41.9	42.7	2.1%

Note: [a] denotes sites used to derive the adjustment factor for locations covered by the Crewe and Winsford transport models. [b] denotes sites used to derive the adjustment factor for locations covered by the Northwich transport model. [c] denotes sites used to derive the adjustment factor for locations along Lewin Street (Middlewich). [d] denotes sites used to derive the adjustment factor for locations along the M6.

5.3 Assessment of construction traffic emissions

5.3.1 The assessment of construction traffic emissions has used traffic data based on an estimate of the average daily flows in the peak year during the construction period (2026–2039). However, vehicle emissions and background concentrations have been taken for the first construction year in 2026. Three construction scenarios have been assessed for air quality to capture peak construction traffic activity at different times in the construction period. It has been assumed that the changes in construction traffic will occur for the whole year. In some cases, this is a conservative approach, as the duration of the peak traffic flows may well be much shorter. These scenarios have been assessed against the relevant future baseline case without the AP2 revised scheme.

5.3.2 Traffic data in the study area have been screened to identify roads that require further assessment and to confirm the likely effect of the change in emissions from vehicles using these roads during construction of the AP2 revised scheme.

5.3.3 Traffic data for construction vehicles using the site haul routes and moving between compounds have also been included in the assessment. Additional roads have also been included in the assessment where relevant to account for their emissions at nearby receptors.

Receptors assessed and background concentrations

5.3.4 Details of the assessed receptors used in the assessment remain as reported within the main ES as amended by SES1 and AP1 ES. There were nine human receptors modelled in the main ES as amended by SES1 and AP1 ES that have not been modelled as part of the AP2 revised scheme due to changes in the study area. Nine receptors have been added due to

changes in the study area. The human receptors and background concentrations are shown in Table 18. The location of all receptors are shown in the accompanying SES2 and AP2 ES Volume 5 Air quality Map Book: Map Series AQ-01 – Air Quality Monitoring Locations and Receptors.

5.3.5 One designated ecological receptor, Wettenhall and Darnhall Woods SSSI, was identified within 200m of the screened in roads within the Hough to Walley's Green (MA02) community area during construction of the AP2 revised scheme.

5.3.6 Table 19 shows the background concentrations for NOx, background nitrogen deposition and critical loads. Table 20 shows the background acid deposition, critical loads and background ammonia concentrations. Acid deposition and ammonia were not previously assessed in the main ES.

Table 18: Modelled human receptors and background concentrations (construction phase)

Receptor	Description/Location	Ordnance Survey coordinates	Background concentrations in 2026 (µg/m^3)			
			NOx	NO_2	PM_{10}	$PM_{2.5}$
02-C-H002	B5074 Swanlow Lane, Winsford	365146, 363858	7.2	5.7	8.9	5.8
02-C-H004	Vauxhall Way, Winsford	364236, 364637	8.1	6.4	9.4	6.2
02-C-H007	Heritage Rise, Winsford	363205, 365586	7.6	6.0	9.6	6.3
02-C-H010	A54 Kinderton Street, Middlewich	370496, 366311	12.3	9.4	10.5	6.8
02-C-H011	Pinfold Lane, Middlewich	369887, 366349	9.8	7.6	10.0	6.5
02-C-H012	A54 Kinderton Street, Middlewich	370626, 366375	12.3	9.4	10.5	6.8
02-C-H013	Over Fair Close, Winsford	362742, 366414	6.5	5.2	9.5	6.0
02-C-H014	A54 Holmes Chapel Road, Middlewich	370766, 366448	12.3	9.4	10.5	6.8
02-C-H015	Middlewich Road, Stanthorne	368902, 366742	9.1	7.1	10.5	6.4
02-C-H016	A54 Holmes Chapel Road, Sproston	373937, 367027	9.1	7.1	10.1	6.2
02-C-H018	Road One, Winsford	366788, 367574	11.5	8.8	10.5	7.1
02-C-H019	Bostock Road, Bostock	367375, 368410	8.9	7.0	9.4	6.1
02-C-H020	A530 King Street, Byley	369781, 368838	8.6	6.7	9.3	6.0
02-C-H021	A530 King Street, Whatcroft	369444, 369855	8.4	6.6	9.7	6.0
02-C-H022	Davenham Road, Northwich	368645, 371484	9.1	7.1	9.2	6.0
02-C-H026	Land Adjacent, A556, Birches Lane, Lostock Gralam Northwich	369524, 373547	9.4	7.3	10.3	6.4
02-C-H029	Hadfield Street, Northwich	366751, 374084	11.1	8.5	9.6	6.3
02-C-H031	Ascol Drive, Plumley	370300, 375502	9.2	7.2	10.4	6.4
02-C-H034	A530 Nantwich Road, Wimboldsley	368809, 362397	9.1	7.1	9.2	5.9
02-C-H035	Alder Way, Holmes Chapel	377099, 367540	9.0	7.1	9.3	6.0
02-C-H038	Middlewich Road, Allostock	373382, 371500	13.1	10.1	11.5	7.2
02-C-H040	Holmes Chapel Road, Knutsford	375803, 376620	9.2	7.2	9.9	6.2
02-C-H046	B5082, Middlewich Road	367352, 373567	10.7	8.2	10.1	6.8

Receptor	Description/Location	Ordnance Survey coordinates	Background concentrations in 2026 (µg/m³)			
			NOx	NO_2	PM_{10}	$PM_{2.5}$
02-C-H050**	Daneside or Saltersford Turnpike, A535, Holmes Chapel	377453, 367807	9.0	7.1	9.3	6.0
02-C-H051**	Knutsford Road, Cranage	374908, 369236	10.5	8.1	11.4	7.0
02-C-H052**	Northwich Road, Cranage, Knutsford	373670, 370568	13.2	10.1	11.4	7.2
02-C-H053**	Northwich Road, Cranage, Knutsford	373260, 370847	13.2	10.1	11.4	7.2
02-C-H054**	Middlewich Road, Allostock	373255, 371475	13.1	10.1	11.5	7.2
02-C-H055**	Chester Road, Plumley	370626, 375723	9.2	7.2	10.5	6.4
02-C-H056**	Holmes Chapel Road, Knutsford	375937, 375883	8.9	7.0	9.7	6.1
02-C-H057**	Plumley Moor Road, Plumley	370872, 375950	9.2	7.2	10.5	6.4
02-C-H058**	A50 Knutsford Road, Holmes Chapel	376217, 367359	10.9	8.4	9.8	6.4

*Note: ** indicates that receptor was added at SES2 and AP2 ES.*

Table 19: Modelled ecological receptor backgrounds and critical loads (construction phase)

Receptor	Sensitive habitat	2026 NOx background concentration (µg/m³)	APIS data of average total N deposition (kg N/ha/yr)	APIS Critical load (kg N/ha/yr)
Wettenhall and Darnhall Woods SSSI	Deciduous woodland	7.0	61.7	10

Table 20: Modelled ecological receptor acid deposition backgrounds, critical loads and ammonia background concentrations (construction phase)

Receptor	Sensitive habitat	APIS data of average total acid deposition (k eq/ha/yr)	APIS Critical load nitrogen (k eq/ha/yr) (min)	APIS Critical load nitrogen (k eq/ha/yr) (max)	APIS Critical load sulphur (k eq/ha/yr) (max)	APIS Ammonia background concentration (µg/m³)
Wettenhall and Darnhall Woods SSSI	Deciduous woodland	4.5	0.1	1.2	1.1	5.1

Assessment results

5.3.7 Table 21 presents the predicted NO_2 impacts across all assessed scenarios for each assessed receptor. All impacts are predicted to be negligible for PM_{10} and $PM_{2.5}$ concentrations. Table 22 to Table 24 provide the summary of the worst-case modelled pollutant concentrations at each assessed receptor (i.e., the highest modelled concentration at a particular receptor

given the different construction traffic scenarios). The magnitude of change and impact descriptor are also provided along with a comparison against the main ES, or alternatively the main ES as amended by SES1 and AP1 ES. These were derived for human receptors following the Institute of Air Quality Management (IAQM)/Environmental Protection UK (EPUK) methodology[8].

5.3.8 Table 22 includes one receptor that was modelled in the main ES as amended by SES1 and AP1 ES, and predicted to have significant effects, but not modelled for the AP2 revised scheme due to changes in the study area and is therefore no longer predicted to have significant effects. Table 25 to Table 28 provide the summary of the worst-case modelled pollutant concentrations at each assessed ecological receptor (i.e., the highest modelled concentration at a particular receptor given the different construction traffic scenarios).

5.3.9 Table 26 provides a summary of the ammonia concentration results taken from the National Highways Ammonia N Deposition Tool[9]. Table 27 provides a summary of the nitrogen deposition receptor results with an additional ammonia component applied using the National Highways Ammonia N Deposition Tool. Table 28 provides a summary of the acid deposition receptor results with an additional ammonia component applied using the National Highways Ammonia N Deposition Tool.

Table 21: Comparison of impact descriptors for annual mean NO_2 concentrations across construction scenarios

Receptor	Impact descriptors for annual mean NO_2 concentrations		
	Scenario 1	Scenario 2	Scenario 3
02-C-H002	Negligible	Negligible	Not applicable
02-C-H004	Negligible	Negligible	Not applicable
02-C-H007	Negligible	Negligible	Not applicable
02-C-H010	Negligible	Negligible	Not applicable
02-C-H011	Negligible	Negligible	Not applicable
02-C-H012	Negligible	Negligible	Not applicable
02-C-H013	Negligible	Negligible	Not applicable
02-C-H014	Negligible	Negligible	Not applicable
02-C-H015	Negligible	Negligible	Not applicable
02-C-H016	Negligible	Negligible	Not applicable
02-C-H018	Negligible	Negligible	Not applicable
02-C-H019	Negligible	Negligible	Not applicable
02-C-H020	Negligible	Negligible	Not applicable
02-C-H021	Negligible	Negligible	Not applicable
02-C-H022	Negligible	Negligible	Not applicable

[8] Institute of Air Quality Management (2017*), Land-Use planning & development control: Planning for air quality, v1.2.* Available online at: https://iaqm.co.uk/guidance/.

[9] National Highways (2021), *Ammonia N Deposition Tool V2*.

Receptor	Impact descriptors for annual mean NO_2 concentrations		
	Scenario 1	Scenario 2	Scenario 3
02-C-H026	Negligible	Negligible	Not applicable
02-C-H029	Negligible	Negligible	Not applicable
02-C-H031	Negligible	Negligible	Not applicable
02-C-H034	Negligible	Moderate beneficial	Not applicable
02-C-H035	Negligible	Negligible	Negligible
02-C-H038	Negligible	Negligible	Negligible
02-C-H040	Negligible	Negligible	Negligible
02-C-H046	Negligible	Negligible	Not applicable
02-C-H050**	Negligible	Negligible	Negligible
02-C-H051**	Negligible	Negligible	Negligible
02-C-H052**	Negligible	Negligible	Negligible
02-C-H053**	Negligible	Negligible	Negligible
02-C-H054**	Negligible	Negligible	Negligible
02-C-H055**	Negligible	Negligible	Negligible
02-C-H056**	Negligible	Negligible	Negligible
02-C-H057**	Negligible	Negligible	Negligible
02-C-H058**	Negligible	Negligible	Negligible

*Note: ** indicates that receptor was added at SES2 and AP2 ES.*

Table 22: Predicted annual mean NO_2 concentrations and impacts (construction phase)

Receptor	Description/Location	NO_2 concentrations ($\mu g/m^3$)		Change in NO_2 concentrations ($\mu g/m^3$)	Impact descriptor	Impact descriptor in the main ES as amended by SES1 and AP1 ES	Significance
		2026 without the AP2 revised scheme	2026 with the AP2 revised scheme				
02-C-H002	B5074 Swanlow Lane, Winsford	17.7	19.5	1.8	Negligible	Negligible	Not significant
02-C-H004	Vauxhall Way, Winsford	9.6	10.9	1.3	Negligible	Negligible	Not significant
02-C-H007	Heritage Rise, Winsford	14.5	15.0	0.5	Negligible	Negligible	Not significant
02-C-H010	A54 Kinderton Street, Middlewich	26.3	28.1	1.8	Negligible	Negligible	Not significant
02-C-H011	Pinfold Lane, Middlewich	26.2	27.8	1.6	Negligible	Slight adverse	Not significant
02-C-H012	A54 Kinderton Street, Middlewich	21.1	22.0	0.9	Negligible	Negligible	Not significant
02-C-H013	Over Fair Close, Winsford	16.0	16.9	0.9	Negligible	Negligible	Not significant
02-C-H014	A54 Holmes Chapel Road, Middlewich	25.5	26.3	0.8	Negligible	Negligible	Not significant
02-C-H015	Middlewich Road, Stanthorne	11.1	12.6	1.5	Negligible	Negligible	Not significant
02-C-H016	A54 Holmes Chapel Road, Sproston	21.6	22.4	0.8	Negligible	Negligible	Not significant
02-C-H018	Road One, Winsford	14.8	16.1	1.3	Negligible	Negligible	Not significant
02-C-H019	Bostock Road, Bostock	10.7	12.4	1.7	Negligible	Negligible	Not significant
02-C-H020	A530 King Street, Byley	24.1	25.3	1.2	Negligible	Negligible	Not significant
02-C-H021	A530 King Street, Whatcroft	23.9	25.1	1.2	Negligible	Negligible	Not significant
02-C-H022	Davenham Road, Northwich	10.5	11.2	0.7	Negligible	Negligible	Not significant
02-C-H026	Land adjacent, A556, Birches Lane, Lostock Gralam	12.0	13.0	1.0	Negligible	Negligible	Not significant
02-C-H029	Hadfield Street, Northwich	17.5	17.9	0.4	Negligible	Negligible	Not significant

Receptor	Description/Location	NO_2 concentrations (µg/m³)		Change in NO_2 concentrations (µg/m³)	Impact descriptor	Impact descriptor in the main ES as amended by SES1 and AP1 ES	Significance
		2026 without the AP2 revised scheme	2026 with the AP2 revised scheme				
02-C-H031	Ascol Drive, Plumley	14.5	15.8	1.3	Negligible	Negligible	Not significant
02-C-H034	A530 Nantwich Road, Wimboldsley	22.3	22.7	0.4	Negligible	Negligible	Not significant
02-C-H035	Alder Way, Holmes Chapel	12.8	13.1	0.3	Negligible	Negligible	Not significant
02-C-H038	Middlewich Road, Allostock	24.9	24.7	-0.2	Negligible	Negligible	Not significant
02-C-H040	Holmes Chapel Road, Knutsford	15.8	16.1	0.3	Negligible	Negligible	Not significant
02-C-H046	B5082, Middlewich Road	22.8	23.6	0.8	Negligible	Negligible	Not significant
02-C-H050**	Daneside or Saltersford Turnpike, A535, Holmes Chapel	12.5	12.8	0.3	Negligible	Negligible	Not significant
02-C-H051**	Knutsford Road, Cranage	11.3	11.4	0.1	Negligible	Negligible	Not significant
02-C-H052**	Northwich Road, Cranage, Knutsford	18.1	18.0	-0.1	Negligible	Negligible	Not significant
02-C-H053**	Northwich Road, Cranage, Knutsford	13.3	13.4	0.1	Negligible	Negligible	Not significant
02-C-H054**	Middlewich Road, Allostock	17.5	17.5	< 0.1	Negligible	Negligible	Not significant
02-C-H055**	Chester Road, Plumley	15.5	16.5	1.0	Negligible	Negligible	Not significant
02-C-H056**	Holmes Chapel Road, Knutsford	12.8	13.0	0.2	Negligible	Negligible	Not significant
02-C-H057**	Plumley Moor Road, Plumley	16.3	17.5	1.2	Negligible	Negligible	Not significant
02-C-H058**	A50 Knutsford Road, Holmes Chapel	17.4	17.6	0.2	Negligible	Not applicable	Not significant
02-C-H048	A530 Nantwich Road, Middlewich	Not applicable	Not applicable	Not applicable	Not applicable	Moderate adverse	Removal of significant effect

*Note: ** indicates that receptor was added at SES2 and AP2 ES.*

Table 23: Predicted annual mean PM_{10} concentrations and impacts (construction phase)

Receptor	Description/Location	PM_{10} concentrations ($\mu g/m^3$)		Change in PM_{10} concentrations ($\mu g/m^3$)	Impact descriptor	Impact descriptor in the main ES as amended by SES1 and AP1 ES	Significance
		2026 without the AP2 revised scheme	2026 with the AP2 revised scheme				
02-C-H002	B5074 Swanlow Lane, Winsford	10.2	10.5	0.3	Negligible	Negligible	Not significant
02-C-H004	Vauxhall Way, Winsford	9.9	10.1	0.2	Negligible	Negligible	Not significant
02-C-H007	Heritage Rise, Winsford	10.7	10.7	<0.1	Negligible	Negligible	Not significant
02-C-H010	A54 Kinderton Street, Middlewich	12.7	12.9	0.2	Negligible	Negligible	Not significant
02-C-H011	Pinfold Lane, Middlewich	12.6	12.9	0.3	Negligible	Negligible	Not significant
02-C-H012	A54 Kinderton Street, Middlewich	12.2	12.4	0.2	Negligible	Negligible	Not significant
02-C-H013	Over Fair Close, Winsford	11.0	11.1	0.1	Negligible	Negligible	Not significant
02-C-H014	A54 Holmes Chapel Road, Middlewich	13.1	13.3	0.2	Negligible	Negligible	Not significant
02-C-H015	Middlewich Road, Stanthorne	10.9	11.0	0.1	Negligible	Negligible	Not significant
02-C-H016	A54 Holmes Chapel Road, Sproston	11.8	12.0	0.2	Negligible	Negligible	Not significant
02-C-H018	Road One, Winsford	11.4	11.6	0.2	Negligible	Negligible	Not significant
02-C-H019	Bostock Road, Bostock	9.8	9.9	0.1	Negligible	Negligible	Not significant
02-C-H020	A530 King Street, Byley	11.4	11.6	0.2	Negligible	Negligible	Not significant
02-C-H021	A530 King Street, Whatcroft	11.8	12.0	0.2	Negligible	Negligible	Not significant
02-C-H022	Davenham Road, Northwich	9.6	9.7	0.1	Negligible	Negligible	Not significant
02-C-H026	Land Adjacent, A556, Birches Lane, Lostock Gralam Northwich	10.9	11.0	0.1	Negligible	Negligible	Not significant
02-C-H029	Hadfield Street, Northwich	10.8	10.8	<0.1	Negligible	Negligible	Not significant
02-C-H031	Ascol Drive, Plumley	11.3	11.5	0.2	Negligible	Negligible	Not significant
02-C-H034	A530 Nantwich Road, Wimboldsley	11.0	11.2	0.2	Negligible	Negligible	Not significant
02-C-H035	Alder Way, Holmes Chapel	10.4	10.5	0.1	Negligible	Negligible	Not significant

Receptor	Description/Location	PM_{10} concentrations (µg/m³)		Change in PM_{10} concentrations (µg/m³)	Impact descriptor	Impact descriptor in the main ES as amended by SES1 and AP1 ES	Significance
		2026 without the AP2 revised scheme	2026 with the AP2 revised scheme				
02-C-H038	Middlewich Road, Allostock	15.3	15.3	< 0.1	Negligible	Negligible	Not significant
02-C-H040	Holmes Chapel Road, Knutsford	11.5	11.6	0.1	Negligible	Negligible	Not significant
02-C-H046	B5082, Middlewich Road	12.4	12.6	0.2	Negligible	Negligible	Not significant
02-C-H050**	Daneside or Saltersford Turnpike, A535, Holmes Chapel	10.4	10.5	0.1	Negligible	Negligible	Not significant
02-C-H051**	Knutsford Road, Cranage	12.0	12.0	< 0.1	Negligible	Negligible	Not significant
02-C-H052**	Northwich Road, Cranage, Knutsford	13.4	13.5	0.1	Negligible	Negligible	Not significant
02-C-H053**	Northwich Road, Cranage, Knutsford	12.0	12.0	< 0.1	Negligible	Negligible	Not significant
02-C-H054**	Middlewich Road, Allostock	13.4	13.4	< 0.1	Negligible	Negligible	Not significant
02-C-H055**	Chester Road, Plumley	12.2	12.6	0.4	Negligible	Negligible	Not significant
02-C-H056**	Holmes Chapel Road, Knutsford	10.8	10.9	0.1	Negligible	Negligible	Not significant
02-C-H057**	Plumley Moor Road, Plumley	12.3	12.8	0.5	Negligible	Negligible	Not significant
02-C-H058**	A50 Knutsford Road, Holmes Chapel	11.8	11.8	< 0.1	Negligible	Not applicable	Not significant
02-C-H048	A530 Nantwich Road, Middlewich	Not applicable	Not applicable	Not applicable	Not applicable	Negligible	Not significant

*Note: ** indicates that receptor was added at SES2 and AP2 ES.*

Table 24: Predicted annual mean $PM_{2.5}$ concentrations and impacts (construction phase)

Receptor	Description/Location	$PM_{2.5}$ concentrations (µg/m³)		Change in $PM_{2.5}$ concentrations (µg/m³)	Impact descriptor	Impact descriptor in the main ES as amended by SES1 and AP1 ES	Significance
		2026 without the AP2 revised scheme	2026 with the AP2 revised scheme				
02-C-H002	B5074 Swanlow Lane, Winsford	6.5	6.7	0.2	Negligible	Negligible	Not significant
02-C-H004	Vauxhall Way, Winsford	6.5	6.6	0.1	Negligible	Negligible	Not significant

Receptor	Description/Location	$PM_{2.5}$ concentrations ($\mu g/m^3$)		Change in $PM_{2.5}$ concentrations ($\mu g/m^3$)	Impact descriptor	Impact descriptor in the main ES as amended by SES1 and AP1 ES	Significance
		2026 without the AP2 revised scheme	2026 with the AP2 revised scheme				
02-C-H007	Heritage Rise, Winsford	6.9	6.9	<0.1	Negligible	Negligible	Not significant
02-C-H010	A54 Kinderton Street, Middlewich	8.0	8.2	0.2	Negligible	Negligible	Not significant
02-C-H011	Pinfold Lane, Middlewich	7.9	8.1	0.2	Negligible	Negligible	Not significant
02-C-H012	A54 Kinderton Street, Middlewich	7.7	7.8	0.1	Negligible	Negligible	Not significant
02-C-H013	Over Fair Close, Winsford	6.8	6.9	0.1	Negligible	Negligible	Not significant
02-C-H014	A54 Holmes Chapel Road, Middlewich	8.2	8.4	0.2	Negligible	Negligible	Not significant
02-C-H015	Middlewich Road, Stanthorne	6.7	6.7	<0.1	Negligible	Negligible	Not significant
02-C-H016	A54 Holmes Chapel Road, Sproston	7.2	7.3	0.1	Negligible	Negligible	Not significant
02-C-H018	Road One, Winsford	7.6	7.7	0.1	Negligible	Negligible	Not significant
02-C-H019	Bostock Road, Bostock	6.3	6.4	0.1	Negligible	Negligible	Not significant
02-C-H020	A530 King Street, Byley	7.2	7.3	0.1	Negligible	Negligible	Not significant
02-C-H021	A530 King Street, Whatcroft	7.3	7.4	0.1	Negligible	Negligible	Not significant
02-C-H022	Davenham Road, Northwich	6.2	6.2	<0.1	Negligible	Negligible	Not significant
02-C-H026	Land Adjacent, A556, Birches Lane, Lostock Gralam Northwich	6.7	6.8	0.1	Negligible	Negligible	Not significant
02-C-H029	Hadfield Street, Northwich	6.9	7.0	0.1	Negligible	Negligible	Not significant
02-C-H031	Ascol Drive, Plumley	7.0	7.1	0.1	Negligible	Negligible	Not significant
02-C-H034	A530 Nantwich Road, Wimboldsley	7.0	7.1	0.1	Negligible	Negligible	Not significant
02-C-H035	Alder Way, Holmes Chapel	6.6	6.2	-0.4	Negligible	Negligible	Not significant
02-C-H038	Middlewich Road, Allostock	9.6	10.3	0.7	Negligible	Negligible	Not significant
02-C-H040*	Holmes Chapel Road, Knutsford	7.1	6.3	-0.8	Negligible	Negligible	Not significant
02-C-H046	B5082, Middlewich Road	8.1	8.1	<0.1	Negligible	Negligible	Not significant

Receptor	Description/Location	$PM_{2.5}$ concentrations (µg/m³)		Change in $PM_{2.5}$ concentrations (µg/m³)	Impact descriptor	Impact descriptor in the main ES as amended by SES1 and AP1 ES	Significance
		2026 without the AP2 revised scheme	2026 with the AP2 revised scheme				
02-C-H050**	Daneside or Saltersford Turnpike, A535, Holmes Chapel	6.6	6.1	-0.5	Negligible	Negligible	Not significant
02-C-H051**	Knutsford Road, Cranage	7.4	7.1	-0.3	Negligible	Negligible	Not significant
02-C-H052**	Northwich Road, Cranage, Knutsford	8.4	8.6	0.2	Negligible	Negligible	Not significant
02-C-H053**	Northwich Road, Cranage, Knutsford	7.6	7.4	-0.2	Negligible	Negligible	Not significant
02-C-H054**	Middlewich Road, Allostock	8.4	8.6	0.2	Negligible	Negligible	Not significant
02-C-H055**	Chester Road, Plumley	7.4	7.0	-0.4	Negligible	Negligible	Not significant
02-C-H056**	Holmes Chapel Road, Knutsford	6.7	6.1	-0.6	Negligible	Negligible	Not significant
02-C-H057**	Plumley Moor Road, Plumley	7.5	7.1	-0.4	Negligible	Negligible	Not significant
02-C-H058**	A50 Knutsford Road, Holmes Chapel	7.5	7.1	-0.4	Negligible	Not applicable	Not significant
02-C-H048	A530 Nantwich Road, Middlewich	Not applicable	Not applicable	Not applicable	Not applicable	Negligible	Not significant

*Note: ** indicates that receptor was added at SES2 and AP2 ES.*

Table 25: Predicted annual mean of NOx concentrations at ecological sites (construction phase)

Ecological site	Sensitive habitat	Distance to road (m)	NOx concentrations (µg/m³)		Change in NOx concentrations (µg/m³)	Comparison against air quality standard (30µg/m³)	Percent change in relation to air quality standard
			2026 without the AP2 revised scheme	2026 with the AP2 revised scheme			
Wettenhall and Darnhall Woods SSSI	Deciduous woodland	80	9.1	9.5	0.4	Within standard	1.3%
	Deciduous woodland	85	9.0	9.4	0.4	Within standard	1.3%
	Deciduous woodland	90	9.0	9.3	0.3	Within standard	1.0%
	Deciduous woodland	100	8.8	9.1	0.3	Within standard	1.0%
	Deciduous woodland	110	8.7	9.0	0.3	Within standard	1.0%

Ecological site	Sensitive habitat	Distance to road (m)	NOx concentrations (µg/m³)		Change in NOx concentrations (µg/m³)	Comparison against air quality standard (30µg/m³)	Percent change in relation to air quality standard
			2026 without the AP2 revised scheme	2026 with the AP2 revised scheme			
	Deciduous woodland	120	8.6	8.9	0.3	Within standard	1.0%
	Deciduous woodland	130	8.5	8.8	0.3	Within standard	1.0%

Table 26: Predicted annual mean of ammonia (NH_3) concentrations at ecological sites (construction phase)

Ecological site	Sensitive habitat	Distance to road (m)	NH_3 concentrations (µg/m³)		Change in NH_3 concentrations (µg/m³)	Comparison against critical level (1µg/m³ for low and 3µg/m³ high vegetation)	Percent change in relation to critical level
			2026 without the AP2 revised scheme	2026 with the AP2 revised scheme			
Wettenhall and Darnhall Woods SSSI	Deciduous woodland	80	5.3	5.3	< 0.1	Above standard	3.3%
	Deciduous woodland	85	5.2	5.3	0.1	Above standard	3.1%
	Deciduous woodland	90	5.2	5.3	0.1	Above standard	3.0%
	Deciduous woodland	100	5.2	5.3	0.1	Above standard	2.8%
	Deciduous woodland	110	5.2	5.2	< 0.1	Above standard	2.6%
	Deciduous woodland	120	5.2	5.2	< 0.1	Above standard	2.4%
	Deciduous woodland	130	5.2	5.2	< 0.1	Above standard	2.3%

Table 27: Assessment of N deposition with ammonia at ecological sites (construction phase)

Ecological Site	Sensitive habitat	Distance to road (m)	Dry deposition (kg N/ha/yr)		Change in N deposition (kg N/ha/yr)	Lower Critical Load (kg N/ha/yr)	Percent change in relation to lower critical load
			2026 without the AP2 revised scheme	2026 with the AP2 revised scheme			
Wettenhall and Darnhall Woods SSSI	Deciduous woodland	80	63.4	63.8	0.4	10	3.2%
	Deciduous woodland	85	63.3	63.7	0.4	10	3.0%
	Deciduous woodland	90	63.3	63.6	0.3	10	2.9%
	Deciduous woodland	100	63.2	63.4	0.2	10	2.7%

Ecological Site	Sensitive habitat	Distance to road (m)	Dry deposition (kg N/ha/yr)		Change in N deposition (kg N/ha/yr)	Lower Critical Load (kg N/ha/yr)	Percent change in relation to lower critical load
			2026 without the AP2 revised scheme	2026 with the AP2 revised scheme			
	Deciduous woodland	110	63.1	63.3	0.2	10	2.5%
	Deciduous woodland	120	63.0	63.2	0.2	10	2.3%
	Deciduous woodland	130	62.9	63.1	0.2	10	2.2%

Table 28: Assessment of acid deposition with ammonia at ecological sites (construction phase)

Ecological Site	Sensitive habitat	Distance to road (m)	Total acid deposition (k eq/ha/yr)		Change in acid deposition (k eq/ha/yr)	Change in acid deposition as percent of CLNmax	With AP2 revised scheme acid deposition as percent of CLNmax
			2026 without the AP2 revised scheme	2026 with the AP2 revised scheme			
Wettenhall and Darnhall Woods SSSI	Deciduous woodland	80	4.6	4.7	0.1	1.8%	379.1%
	Deciduous woodland	85	4.6	4.7	0.1	1.7%	378.5%
	Deciduous woodland	90	4.6	4.6	< 0.1	1.7%	378.1%
	Deciduous woodland	100	4.6	4.6	< 0.1	1.6%	377.3%
	Deciduous woodland	110	4.6	4.6	< 0.1	1.5%	376.6%
	Deciduous woodland	120	4.6	4.6	< 0.1	1.3%	376.0%
	Deciduous woodland	130	4.6	4.6	< 0.1	1.3%	375.5%

5.3.10 The annual mean NO_2, PM_{10} and $PM_{2.5}$ concentrations are predicted to be within the air quality standards during construction of the AP2 revised scheme. Since the annual mean NO_2 concentrations are predicted to be well below 60µg/m³, the hourly mean standard is also expected to be met. Similarly, since the annual mean PM_{10} concentrations are predicted to be below 35µg/m³, the daily mean standard is also expected to be met.

5.3.11 Negligible impacts are predicted at all human receptors in the area for annual mean NO_2, PM_{10} and $PM_{2.5}$ concentrations.

5.3.12 NOx concentrations at Wettenhall and Darnhall Woods SSSI are predicted to be within the air quality standard, both without and with the AP2 revised scheme. The changes in NOx concentrations are greater than 1% of the air quality standard, at a distance between 85 and 90m from the road.

5.3.13 NH_3 concentrations at Wettenhall and Darnhall Woods SSSI are predicted to be above the relevant critical level, both without and with the AP2 revised scheme, and the changes in NH_3 concentrations are greater than 1% of the air quality critical level up to 130m from the road.

5.3.14 The change in nitrogen deposition due to the AP2 revised scheme is predicted to be greater than 1% of the lower critical load for this site up to 130m from the road.

5.3.15 The change in acid deposition due to the AP1 revised scheme is predicted to be greater than 1% of the maximum nitrogen critical load for this site up to 130m from the road.

Assessment of significance

5.3.16 No significant effects are anticipated at any receptors in relation to annual mean NO_2, PM_{10} or $PM_{2.5}$ concentrations.

5.3.17 There was one significant adverse effect for annual mean NO_2 concentrations reported in the main ES as amended by SES1 and AP1 ES. This was at location 02-C-H048. This significant effect has now been removed due to the AP2 revised scheme. There are no new or different significant effects from the construction of the AP2 revised scheme compared to the main ES as amended by SES1 and AP1 ES for other human receptors.

5.3.18 Since the change in NOx concentrations are predicted to be greater than 1% of the air quality standard, there is the potential for significant effects to occur at Wettenhall and Darnhall Woods SSSI up to between 85m and 90m from the road due to NOx concentrations.

5.3.19 Since the change in NH_3 concentrations are predicted to be greater than 1% of the air quality critical level, there is the potential for significant effects to occur at Wettenhall and Darnhall Woods SSSI up to 130m from the road due to NH_3 concentrations.

5.3.20 Since the change in N deposition is predicted to be greater than 1% of the lower critical load, there is the potential for significant effects to occur at Wettenhall and Darnhall Woods SSSI up to 130m from the road due to N deposition.

5.3.21 Since the change in acid deposition is predicted to be greater than 1% of the maximum nitrogen critical load, there is the potential for significant effects to occur at Wettenhall and Darnhall Woods SSSI up to 130m from the road due to acid deposition.

5.3.22 There is the potential for new significant effects from the construction of the AP2 revised scheme compared to the main ES as amended by SES1 and AP1 ES at Wettenhall and Darnhall Woods SSSI for NOx concentrations, nitrogen and acid deposition.

5.4 Assessment of operational traffic emissions

Operational traffic model

5.4.1 For the assessment of traffic on the highway network, data for the year 2039 were used as the operational year of the AP2 revised scheme.

Screening of traffic data

5.4.2 The screening process identified 20 roads in the Wimboldsley to Lostock Gralam (MA02) community area exceeding the thresholds for changes in AADT or daily HDV flows and/or changes in road alignment by 5m or more. These roads include:

- the A54 Chester Road/Holmes Chapel Road/Kinderton Street/Middlewich Road/St Michael's Way/Town Bridge/Wharton Road Roundabout;
- the A530 Griffiths Road/King Street/Nantwich Road;
- the A533 Bostock Road/Leadsmithy Street/Lewin Street/Northwich Road;
- the A556 Chester Road/London Road/Shurlach Road; and
- the A5018 Wharton Road.

5.4.3 Further roads have been included in the assessment to account for their emissions at nearby receptors.

Receptors assessed and background concentrations

5.4.4 Details of the assessed receptors and the background concentrations used in the assessment remain as reported within the main ES as amended by SES1 and AP1 ES. There were eight human receptors modelled in the main ES as amended by SES1 and AP1 ES, that have not been modelled as part of the AP2 revised scheme due to changes in the study area. Details of the assessed human receptors and background concentrations used in the assessment are shown in Table 29. The location of all receptors is shown in the accompanying SES2 and AP2 ES Volume 5 Air quality Map Book: Map Series AQ-01– Monitoring Locations and Receptors.

5.4.5 No designated ecological receptors were identified within 200m of the screened in roads within the Wimboldsley to Lostock Gralam (MA02) community area during operation of the AP2 revised scheme.

Table 29: Modelled human receptors and background concentrations (operational phase)

Receptor	Description/Location	Ordnance Survey coordinates	Background concentrations in 2039 (µg/m^3)			
			NOx	NO_2	PM_{10}	$PM_{2.5}$
2-O-H01	Nantwich Road, Occleston	368802, 362391	8.7	6.8	9.1	5.9
2-O-H02	Primary School, Occleston	368937, 363622	8.1	6.3	9.4	5.9
2-O-H03	Nantwich Road, Occleston	368809, 364705	8.1	6.4	10.5	6.2
2-O-H04	Clive Green Lane, Occleston	368217, 365074	9.4	7.3	10.3	6.3
2-O-H05	Clive Green Lane, Occleston	367834, 365142	8.0	6.3	9.8	6.1
2-O-H06	Nantwich Road, Occleston	369163, 365198	9.8	7.6	10.0	6.3
2-O-H07	Clive Green Lane, Winsford	367335, 365747	8.0	6.3	9.8	6.1
2-O-H08	Clive Green Lane, Winsford	367280, 365953	8.0	6.3	9.8	6.1
2-O-H09	Clive Green Lane, Winsford	367289, 366012	11.3	8.6	9.6	6.3
2-O-H10	Middlewich Road, Winsford	367749, 366003	11.3	8.6	9.6	6.3
2-O-H11	Middlewich Road, Winsford	367938, 366107	11.3	8.6	9.6	6.3
2-O-H14	Middlewich Road, Middlewich	369197, 366771	9.2	7.2	9.9	6.4
2-O-H15	Bostock Road, Winsford	368350, 367107	8.8	6.9	10.2	6.3
2-O-H18	Holmes Chapel Road, Northwich	370473, 372047	7.9	6.2	9.3	5.9
2-O-H19	Penny's Lane, Northwich	369395, 372345	8.5	6.6	9.5	6.0
2-O-H22	Birches Lane, Northwich	369744, 373348	8.7	6.8	10.3	6.4
2-O-H23	Birches Lane, Northwich	369457, 373605	8.7	6.8	10.3	6.4
2-O-H24	Birches Lane, Northwich	369427, 373863	8.7	6.8	10.3	6.4
2-O-H25	Birches Lane, Northwich	369201, 373956	8.7	6.8	10.3	6.4
2-O-H26	Harris Road, Northwich	369669, 374700	9.5	7.4	10.4	6.5
2-O-H27	Lostock Lodge, Northwich	369831, 375123	8.9	7.0	10.1	6.3
2-O-H30	Coal Pit Lane, Middlewich	369020, 366312	9.2	7.2	9.9	6.4
2-O-H31	A54 Chester Road, Middlewich	369784, 366481	9.2	7.2	9.9	6.4
2-O-H32	A54 Middlewich Road, Middlewich	368224, 366608	8.6	6.7	10.4	6.4
2-O-H34	A530 Griffiths Road, Northwich	368637, 374720	10.2	7.9	9.6	6.3

Assessment results

5.4.6 Table 30 to Table 32 provide the summary of the modelled pollutant concentrations for the assessed human receptors. The magnitude of change and impact descriptor are provided along with a comparison against the main ES, or alternatively the main ES as amended by SES1 and AP1 ES. These were derived following the IAQM/EPUK methodology[8].

Table 30: Predicted annual mean NO_2 concentrations and impacts (operation phase)

Receptor	Description/Location	NO_2 concentrations ($\mu g/m^3$)		Change in NO_2 concentrations ($\mu g/m^3$)	Impact descriptor	Impact descriptor in the main ES as amended by SES1 and AP1 ES	Significance
		2039 without the AP2 revised scheme	2039 with the AP2 revised scheme				
2-O-H01	Nantwich Road, Occleston	15.7	9.3	-6.4	Moderate beneficial	Moderate beneficial	Significant (not different)
2-O-H02	Primary School, Occleston	12.4	12.8	0.4	Negligible	Negligible	Not significant
2-O-H03	Nantwich Road, Occleston	12.2	12.6	0.4	Negligible	Negligible	Not significant
2-O-H04	Clive Green Lane, Occleston	10.4	8.7	-1.7	Negligible	Slight beneficial	Not significant
2-O-H05	Clive Green Lane, Occleston	8.2	10.1	1.9	Negligible	Negligible	Not significant
2-O-H06	Nantwich Road, Occleston	12.6	13.1	0.5	Negligible	Negligible	Not significant
2-O-H07	Clive Green Lane, Winsford	9.0	11.3	2.3	Slight adverse	Negligible	Not significant
2-O-H08	Clive Green Lane, Winsford	9.8	11.4	1.6	Negligible	Negligible	Not significant
2-O-H09	Clive Green Lane, Winsford	14.8	16.2	1.4	Negligible	Negligible	Not significant
2-O-H10	Middlewich Road, Winsford	16.0	14.3	-1.7	Negligible	Negligible	Not significant
2-O-H11	Middlewich Road, Winsford	11.0	10.5	-0.5	Negligible	Negligible	Not significant
2-O-H14	Middlewich Road, Middlewich	13.4	12.1	-1.3	Negligible	Negligible	Not significant
2-O-H15	Bostock Road, Winsford	8.7	8.1	-0.6	Negligible	Negligible	Not significant
2-O-H18	Holmes Chapel Road, Northwich	9.9	10.0	0.1	Negligible	Negligible	Not significant
2-O-H19	Penny's Lane, Northwich	9.1	10.1	1.0	Negligible	Negligible	Not significant
2-O-H22	Birches Lane, Northwich	8.2	8.1	-0.1	Negligible	Negligible	Not significant
2-O-H23	Birches Lane, Northwich	8.7	8.3	-0.4	Negligible	Negligible	Not significant
2-O-H24	Birches Lane, Northwich	12.2	8.8	-3.4	Slight beneficial	Slight beneficial	Not significant
2-O-H25	Birches Lane, Northwich	8.7	9.3	0.6	Negligible	Negligible	Not significant
2-O-H26	Harris Road, Northwich	11.3	11.3	< 0.1	Negligible	Negligible	Not significant

Receptor	Description/Location	NO_2 concentrations ($\mu g/m^3$)		Change in NO_2 concentrations ($\mu g/m^3$)	Impact descriptor	Impact descriptor in the main ES as amended by SES1 and AP1 ES	Significance
		2039 without the AP2 revised scheme	2039 with the AP2 revised scheme				
2-O-H27	Lostock Lodge, Northwich	11.1	11.1	< 0.1	Negligible	Negligible	Not significant
2-O-H30	Coal Pit Lane, Middlewich	8.5	9.1	0.6	Negligible	Negligible	Not significant
2-O-H31	A54 Chester Road, Middlewich	19.3	17.3	-2.0	Negligible	Negligible	Not significant
2-O-H32	A54 Middlewich Road, Middlewich	7.6	7.7	0.1	Negligible	Negligible	Not significant
2-O-H34	A530 Griffiths Road, Northwich	11.4	11.1	-0.3	Negligible	Negligible	Not significant

Table 31: Predicted annual mean PM_{10} concentrations and impacts (operation phase)

Receptor	Description/Location	PM_{10} concentrations ($\mu g/m^3$)		Change in PM_{10} concentrations ($\mu g/m^3$)	Impact descriptor	Impact descriptor in the main ES, or the main ES as amended by SES1 and AP1 ES	Significance
		2039 without the AP2 revised scheme	2039 with the AP2 revised scheme				
2-O-H01	Nantwich Road, Occleston	11.0	9.6	-1.4	Negligible	Negligible	Not significant
2-O-H02	Primary School, Occleston	10.7	10.8	0.1	Negligible	Negligible	Not significant
2-O-H03	Nantwich Road, Occleston	11.7	11.8	0.1	Negligible	Negligible	Not significant
2-O-H04	Clive Green Lane, Occleston	11.0	10.6	-0.4	Negligible	Negligible	Not significant
2-O-H05	Clive Green Lane, Occleston	10.2	10.6	0.4	Negligible	Negligible	Not significant
2-O-H06	Nantwich Road, Occleston	11.0	11.1	0.1	Negligible	Negligible	Not significant
2-O-H07	Clive Green Lane, Winsford	10.3	10.8	0.5	Negligible	Negligible	Not significant
2-O-H08	Clive Green Lane, Winsford	10.4	10.8	0.4	Negligible	Negligible	Not significant
2-O-H09	Clive Green Lane, Winsford	10.8	11.1	0.3	Negligible	Negligible	Not significant
2-O-H10	Middlewich Road, Winsford	11.2	10.8	-0.4	Negligible	Negligible	Not significant
2-O-H11	Middlewich Road, Winsford	10.1	10.0	-0.1	Negligible	Negligible	Not significant
2-O-H14	Middlewich Road, Middlewich	11.0	10.8	-0.2	Negligible	Negligible	Not significant

Receptor	Description/Location	PM_{10} concentrations (µg/m³)		Change in PM_{10} concentrations (µg/m³)	Impact descriptor	Impact descriptor in the main ES, or the main ES as amended by SES1 and AP1 ES	Significance
		2039 without the AP2 revised scheme	2039 with the AP2 revised scheme				
2-O-H15	Bostock Road, Winsford	10.6	10.5	-0.1	Negligible	Negligible	Not significant
2-O-H18	Holmes Chapel Road, Northwich	10.1	10.1	< 0.1	Negligible	Negligible	Not significant
2-O-H19	Penny's Lane, Northwich	10.1	10.3	0.2	Negligible	Negligible	Not significant
2-O-H22	Birches Lane, Northwich	10.6	10.6	< 0.1	Negligible	Negligible	Not significant
2-O-H23	Birches Lane, Northwich	10.7	10.6	-0.1	Negligible	Negligible	Not significant
2-O-H24	Birches Lane, Northwich	11.4	10.7	-0.7	Negligible	Negligible	Not significant
2-O-H25	Birches Lane, Northwich	10.7	10.8	0.1	Negligible	Negligible	Not significant
2-O-H26	Harris Road, Northwich	11.2	11.2	< 0.1	Negligible	Negligible	Not significant
2-O-H27	Lostock Lodge, Northwich	11.1	11.1	< 0.1	Negligible	Negligible	Not significant
2-O-H30	Coal Pit Lane, Middlewich	10.2	10.3	0.1	Negligible	Negligible	Not significant
2-O-H31	A54 Chester Road, Middlewich	12.4	12.0	-0.4	Negligible	Negligible	Not significant
2-O-H32	A54 Middlewich Road, Middlewich	10.6	10.6	< 0.1	Negligible	Negligible	Not significant
2-O-H34	A530 Griffiths Road, Northwich	10.6	10.5	-0.1	Negligible	Negligible	Not significant

Table 32: Predicted annual mean $PM_{2.5}$ concentrations and impacts (operation phase)

Receptor	Description/Location	$PM_{2.5}$ concentrations (µg/m³)		Change in $PM_{2.5}$ concentrations (µg/m³)	Impact descriptor	Impact descriptor in the main ES, or the main ES as amended by SES1 and AP1 ES	Significance
		2039 without the AP2 revised scheme	2039 with the AP2 revised scheme				
2-O-H01	Nantwich Road, Occleston	7.0	6.2	-0.8	Negligible	Negligible	Not significant
2-O-H02	Primary School, Occleston	6.7	6.7	< 0.1	Negligible	Negligible	Not significant
2-O-H03	Nantwich Road, Occleston	6.9	7.0	0.1	Negligible	Negligible	Not significant
2-O-H04	Clive Green Lane, Occleston	6.6	6.4	-0.2	Negligible	Negligible	Not significant

Receptor	Description/Location	$PM_{2.5}$ concentrations (µg/m³)		Change in $PM_{2.5}$ concentrations (µg/m³)	Impact descriptor	Impact descriptor in the main ES, or the main ES as amended by SES1 and AP1 ES	Significance
		2039 without the AP2 revised scheme	2039 with the AP2 revised scheme				
2-O-H05	Clive Green Lane, Occleston	6.3	6.6	0.3	Negligible	Negligible	Not significant
2-O-H06	Nantwich Road, Occleston	6.9	7.0	0.1	Negligible	Negligible	Not significant
2-O-H07	Clive Green Lane, Winsford	6.4	6.7	0.3	Negligible	Negligible	Not significant
2-O-H08	Clive Green Lane, Winsford	6.5	6.7	0.2	Negligible	Negligible	Not significant
2-O-H09	Clive Green Lane, Winsford	7.0	7.1	0.1	Negligible	Negligible	Not significant
2-O-H10	Middlewich Road, Winsford	7.2	7.0	-0.2	Negligible	Negligible	Not significant
2-O-H11	Middlewich Road, Winsford	6.6	6.5	-0.1	Negligible	Negligible	Not significant
2-O-H14	Middlewich Road, Middlewich	7.1	7.0	-0.1	Negligible	Negligible	Not significant
2-O-H15	Bostock Road, Winsford	6.5	6.4	-0.1	Negligible	Negligible	Not significant
2-O-H18	Holmes Chapel Road, Northwich	6.3	6.3	< 0.1	Negligible	Negligible	Not significant
2-O-H19	Penny's Lane, Northwich	6.3	6.5	0.2	Negligible	Negligible	Not significant
2-O-H22	Birches Lane, Northwich	6.5	6.5	< 0.1	Negligible	Negligible	Not significant
2-O-H23	Birches Lane, Northwich	6.6	6.5	-0.1	Negligible	Negligible	Not significant
2-O-H24	Birches Lane, Northwich	7.0	6.6	-0.4	Negligible	Negligible	Not significant
2-O-H25	Birches Lane, Northwich	6.6	6.7	0.1	Negligible	Negligible	Not significant
2-O-H26	Harris Road, Northwich	7.0	7.0	< 0.1	Negligible	Negligible	Not significant
2-O-H27	Lostock Lodge, Northwich	6.9	6.9	< 0.1	Negligible	Negligible	Not significant
2-O-H30	Coal Pit Lane, Middlewich	6.6	6.6	< 0.1	Negligible	Negligible	Not significant
2-O-H31	A54 Chester Road, Middlewich	7.8	7.6	-0.2	Negligible	Negligible	Not significant
2-O-H32	A54 Middlewich Road, Middlewich	6.5	6.5	< 0.1	Negligible	Negligible	Not significant
2-O-H34	A530 Griffiths Road, Northwich	6.8	6.7	-0.1	Negligible	Negligible	Not significant

5.4.7 The annual mean NO_2, PM_{10} and $PM_{2.5}$ concentrations are predicted to be within the air quality standards during operation of the AP2 revised scheme. Since the annual mean NO_2 concentrations are predicted to be well below 60µg/m³, the hourly mean standard is also expected to be met. Similarly, since the annual mean PM_{10} concentrations are predicted to be below 35µg/m³, the daily mean standard is also expected to be met.

5.4.8 Negligible or slight impacts are predicted at all but one human receptors in the area for annual mean NO_2 concentrations. One modelled residential receptor will experience significant beneficial effects for NO_2 concentrations in the Wimboldsley to Lostock Gralam (MA02) community area due to the realignment of this road. This is receptor 2-O-H01. Negligible impacts are predicted at all human receptors for annual mean PM_{10} and $PM_{2.5}$ concentrations.

Assessment of significance

5.4.9 One modelled residential receptor is predicted to experience significant beneficial effects for NO_2 concentrations in the Wimboldsley to Lostock Gralam (MA02) community area. No significant effects are anticipated at any receptors in relation to annual mean PM_{10} and $PM_{2.5}$ concentrations.

5.4.10 There are no new or different significant effects from the operation of the AP2 revised scheme compared to the main ES as amended by SES1 and AP1 ES. It should be noted that while the AP1 amendments have been included, these AP1 amendments have not been approved.

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