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OXFORDSHIRE

STRATEGIC RAIL FREIGHT INTERCHANGE

DCO Submission

Environmental Statement

Chapter 4: Air Quality and Odour
Appendix 4.4: Modelling Inputs and Verification

Document 6.4D

On behalf of
Oxfordshire Railfreight Limited

Prepared by Phlorum
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Appendix 4.4: Modelling Inputs and Verification

Air Quality Model Verification

Model verification studies are undertaken to check the performance of dispersion models and, where modelled concentrations are significantly different to monitored concentrations, a factor can be established by which the modelled results can be adjusted to improve their reliability. The model verification process is detailed in LAQM.TG(22)[1] and identifies that no adjustment is necessary where the results of a model all lie within 25% of monitored concentrations.

Model verification can only be undertaken where there are sufficient roadside monitoring data and traffic data in the vicinity of the subject scheme being assessed. 2024 Baseline traffic data provided by the Project Transport Consultant encompassed the majority of the major road network listed in Paragraph 4.2.33 of **ES Chapter 4: Air Quality and Odour**. These traffic data enabled the assessor to verify 2024 data from 37 no. diffusion tube monitoring locations from Cherwell District Council's (CDC)[2], the Vale of White Horse District Council's (VoWHDC)[3] and Oxford City Council's (OCC)[4] air quality monitoring networks.

Table 4.4.1 compares the monitored and modelled NO_2 concentrations (2024) at the 37 no. monitoring locations.

Table 4.4.1: Monitored and Modelled NO_2 Concentrations at Local Monitoring Sites

Monitor	Monitor Type	Annual Mean NO_2 Concentrations ($\mu g.m^{-3}$)		
		Monitored	Modelled	% Difference
S21	Diffusion Tube	15.5	14.3	-7.7%
S22	Diffusion Tube	21.4	13.6	-36.5%
S27/28/29	Diffusion Tube	26.0	17.9	-31.2%
S30	Diffusion Tube	27.7	19.9	-28.3%
S35	Diffusion Tube	21.5	14.1	-34.5%
S36	Diffusion Tube	21.5	16.3	-24.3%
S37	Diffusion Tube	22.7	14.5	-36.1%
S23	Diffusion Tube	16.5	13.1	-20.5%
S24	Diffusion Tube	23.0	15.0	-34.8%
S33	Diffusion Tube	18.3	13.3	-27.4%

1 DEFRA (2025). *Local Air Quality Management Technical Guidance (TG22)*.
2 Cherwell District Council (2025). *2025 Air Quality Annual Status Report (ASR).*
3 South Oxfordshire District Council and Vale of White Horse District Council (2025). *2025 Air Quality Annual Status Report (ASR).*
4 Oxford City Council (2025). *2025 Air Quality Annual Status Report (ASR).*

Monitor	Monitor Type	Annual Mean NO_2 Concentrations ($\mu g.m^{-3}$)		
		Monitored	Modelled	% Difference
VS16	Diffusion Tube	34.0	31.1	-8.5%
VS17	Diffusion Tube	40.1	32.2	-19.7%
VS18	Diffusion Tube	18.8	19.1	1.7%
VS19	Diffusion Tube	19.9	18.2	-8.3%
VS20	Diffusion Tube	40.5	33.6	-17.1%
VS21	Diffusion Tube	17.4	17.6	0.9%
VS22	Diffusion Tube	20.6	17.1	-16.8%
VS33	Diffusion Tube	17.5	15.8	-10.0%
TF2	Diffusion Tube	11.0	12.5	13.4%
TF3	Diffusion Tube	19.0	16.0	-16.0%
TF37	Diffusion Tube	24.0	23.4	-2.6%
DT71	Diffusion Tube	24.0	19.3	-19.7%
DT83	Diffusion Tube	28.0	25.5	-9.0%
DT27	Diffusion Tube	16.0	17.4	8.5%
DT28	Diffusion Tube	18.0	15.5	-13.7%
TF26	Diffusion Tube	17.0	15.5	-9.1%
TF27	Diffusion Tube	29.0	21.2	-27.1%
DT84	Diffusion Tube	12.0	12.1	0.8%
DT36	Diffusion Tube	11.0	12.4	13.1%
DT35	Diffusion Tube	17.0	16.4	-3.4%
DT64	Diffusion Tube	13.0	13.2	1.5%
DT60	Diffusion Tube	17.0	15.0	-12.1%
DT59	Diffusion Tube	15.0	14.5	-3.5%
TF21	Diffusion Tube	15.0	16.8	11.9%
TF36	Diffusion Tube	31.0	23.8	-23.4%
S3	Diffusion Tube	62.3	29.6	-52.5%
S4	Diffusion Tube	48.4	28.3	-41.5%

The data in Table 4.4.1 show that the model was performing to varying degrees of accuracy, but with a tendency to under-predict concentrations. This is a pattern frequently seen in model verification studies and is likely the result of local variation in dispersion characteristics. Despite 27 of the 37 modelled results being within 25% of monitored results, it was decided to proceed with adjustment, both to account for the systematic underprediction and to bring all model results to within 25% of monitored values, in line with LAQM.TG(22) guidance.

A series of different adjustment factors were applied to different geographical areas within the model.

The Project Transport Consultant used the Bicester Transport Model (BTM) for the provision of the majority of the 2024 baseline traffic data. The diffusion tube in Ardley (S21) performed considerably better than the other monitoring locations within the BTM domain, so was treated separately and no adjustment was deemed necessary.

The Oxford Air Quality Management Area (AQMA), Banbury AQMA (CDC AQMA No.1) and Botley AQMA were all located outside the BTM domain, so were based on Department for Transport (DfT) traffic data[5] collated by the Project Transport Consultant. Modelling traffic data from a different source led to a differing degree of accuracy against monitored data, so a separate adjustment factor was used.

The diffusion tubes within the Banbury AQMA (S3 and S4) showed monitored concentrations which were markedly greater than anywhere else in the model domain. Despite reasonable attempts to consider the Banbury AQMA accurately, the model continued to underperform to a greater degree than elsewhere. It is likely that the pollutant dispersion model was unable to sufficiently account for the influence of the physical barriers either side of the Banbury AQMA (i.e. the dense woodland and tall fenceline). Therefore, a separate verification factor was applied in the Banbury AQMA to uplift concentrations at this location.

Lastly, there are four diffusion tubes along roadsides directly adjacent to the Oxford Meadows Special Area of Conservation (SAC); these are TF2, TF3, TF36 and TF37. Given the opportunity to establish a site-specific adjustment factor for this SAC, which has been identified as a priority site by Natural England, it was deemed appropriate to apply a separate adjustment factor here also.

As it is primary NO_x, rather than secondary NO_2, emissions that are modelled, an adjustment factor must be derived for the road contribution of NO_X.

The graphs below plot the modelled versus monitored road NO_X concentrations for each of the four above listed adjustment areas.

5 Department for Transport. (2026). Available from: https://roadtraffic.dft.gov.uk/.

Figure 4.4.1: Monitored and Modelled NO_X in the BTM model domain

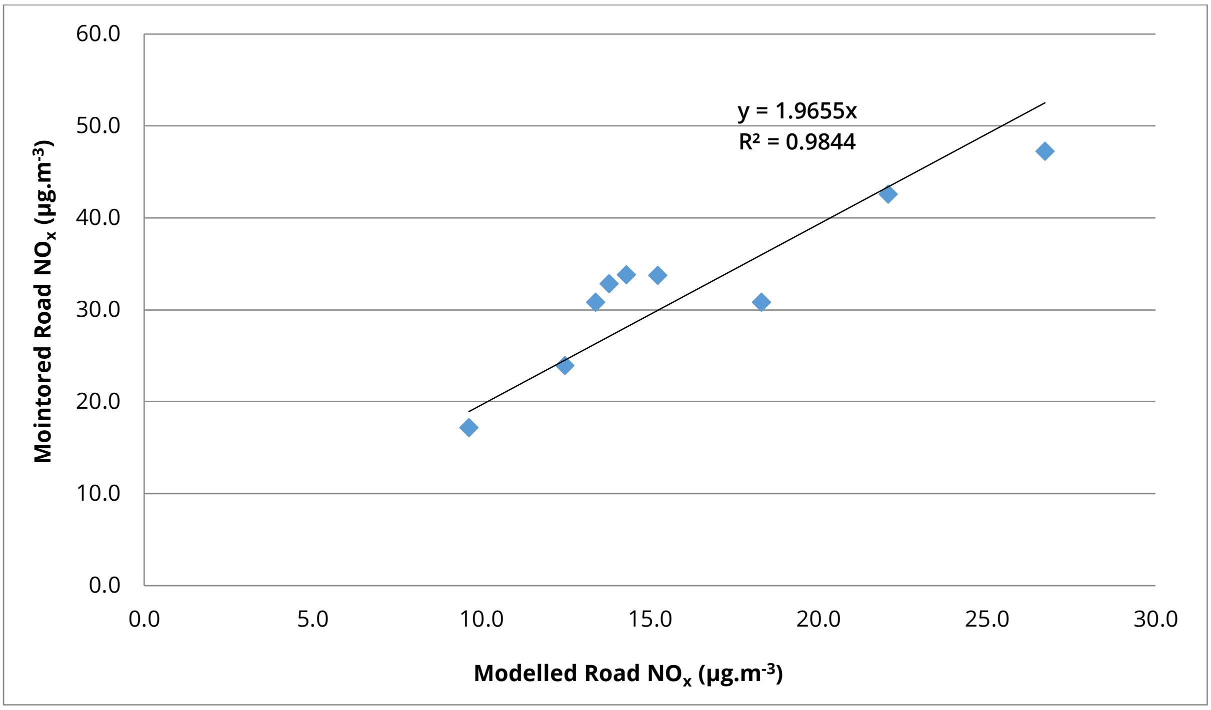


Figure 4.4.2: Monitored and Modelled NO_X in Oxford AQMA and Botley AQMA

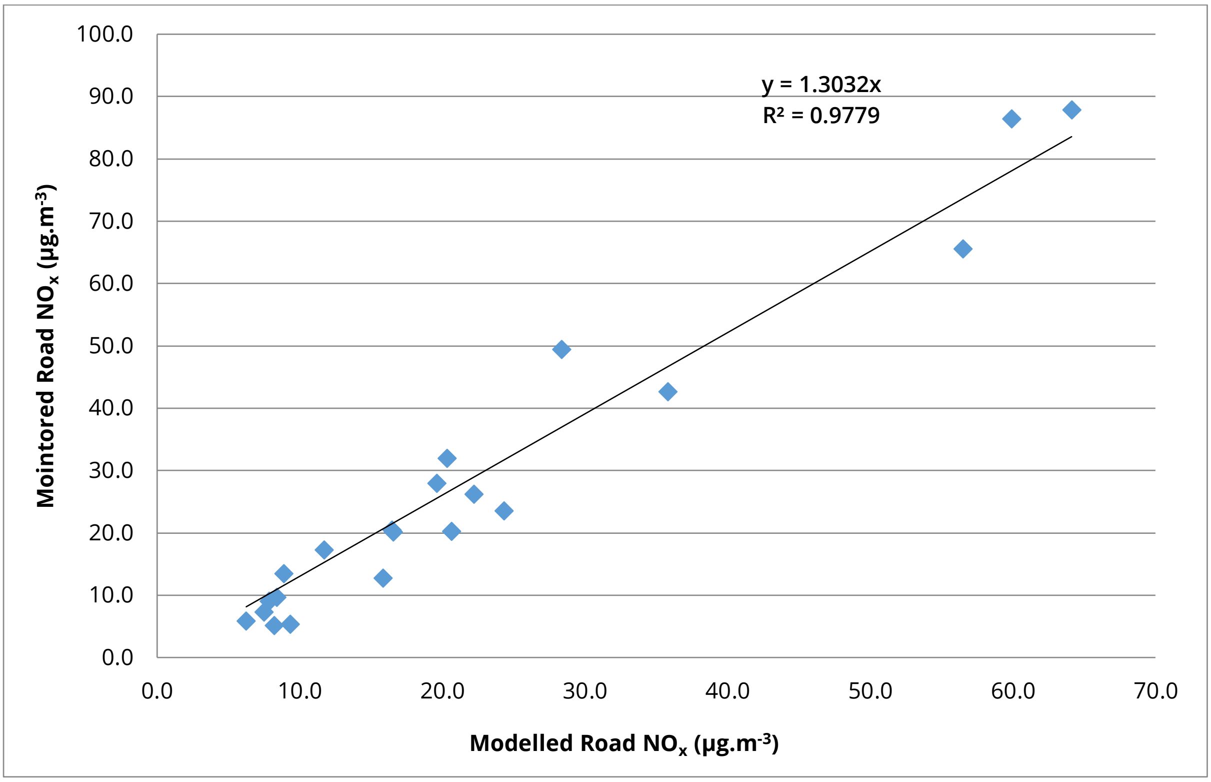


Figure 4.4.3: Monitored and Modelled NO_X in Banbury AQMA

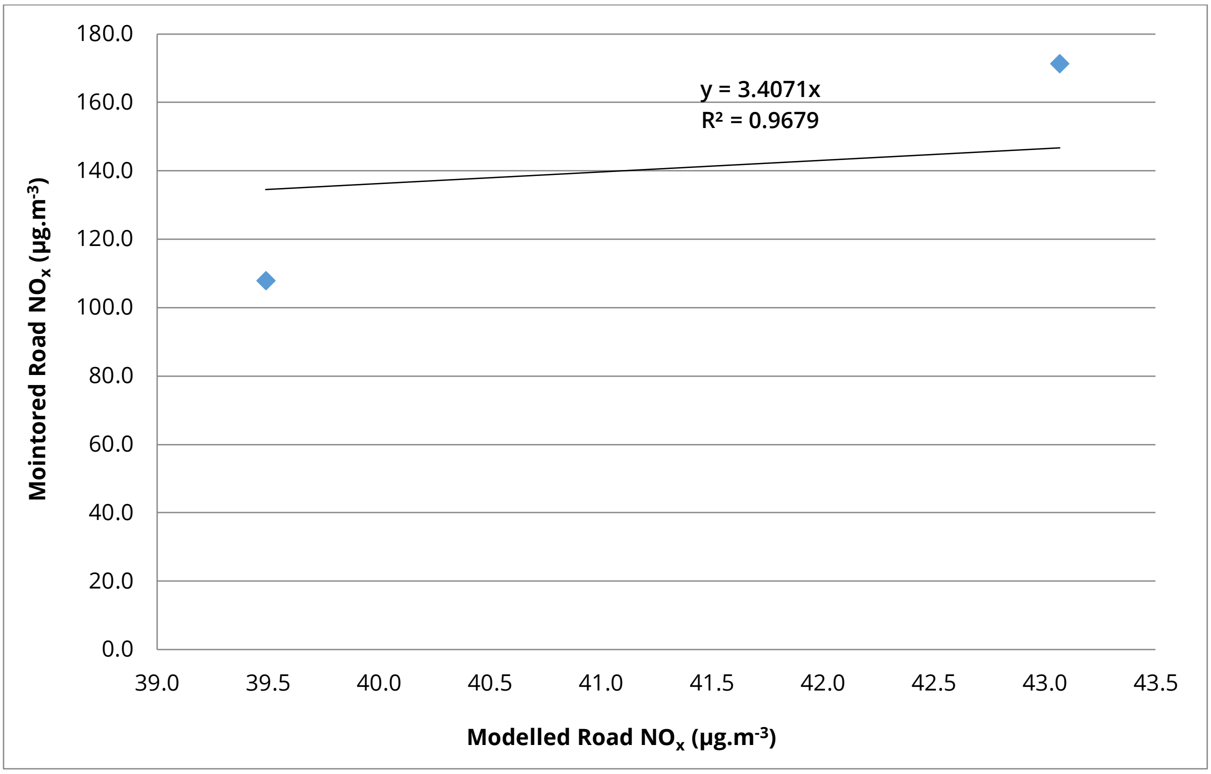
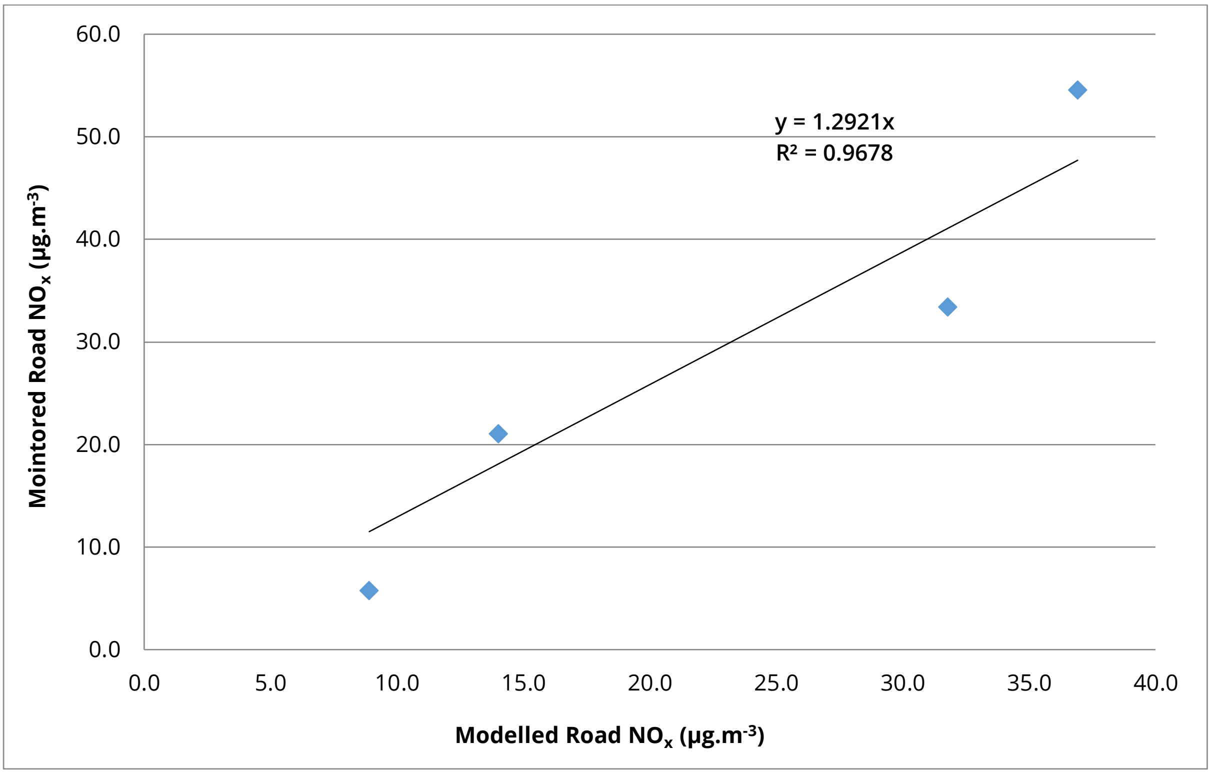


Figure 4.4.4: Monitored and Modelled NO_X in Oxford Meadows SAC



Adjustment factors for each of the areas were derived by plotting trend lines for each graph. Table 4.4.2 below shows the total monitored and modelled NO_2 concentrations following adjustment of NO_X by the above factors. It shows that, following adjustment, all modelled NO_2 concentrations are within 25% of monitored values. As a result, these adjustment factors were considered appropriate for the adjustment of modelled road contributions of NO_X for the Proposed Development.

Table 4.4.2: Monitored and Adjusted Modelled NO_2 Concentrations at Local Monitoring Sites

Monitor	Adjustment Factor	Annual Mean NO_2 Concentrations (µg.m^{-3})		
		Monitored	Modelled	% Difference
S21	1.00	15.5	14.3	-7.7%
S22	1.97	21.4	19.9	-7.1%
S27/28/29	1.97	26.0	26.3	1.2%
S30	1.97	27.7	29.5	6.6%
S35	1.97	21.5	19.7	-8.5%
S36	1.97	21.5	23.5	9.5%
S37	1.97	22.7	20.4	-10.0%
S23	1.97	16.5	17.3	4.7%
S24	1.97	23.0	20.7	-10.0%
S33	1.97	18.3	18.6	1.5%
VS16	1.30	34.0	36.5	7.4%
VS17	1.30	40.1	37.8	-5.7%
VS18	1.30	18.8	22.2	17.9%
VS19	1.30	19.9	21.1	5.8%
VS20	1.30	40.5	39.4	-2.8%
VS21	1.30	17.4	20.2	16.2%
VS22	1.30	20.6	19.7	-4.5%
VS33	1.30	17.5	18.0	2.6%
TF2	1.29	11.0	13.7	24.3%
TF3	1.29	19.0	17.8	-6.6%
TF37	1.29	24.0	26.9	12.0%
DT71	1.30	24.0	21.9	-8.9%
DT83	1.30	28.0	29.5	5.3%
DT27	1.30	16.0	19.5	21.6%
DT28	1.30	18.0	17.1	-4.8%
TF26	1.30	17.0	17.7	3.9%

Monitor	Adjustment Factor	Annual Mean NO_2 Concentrations ($\mu g.m^{-3}$)		
		Monitored	Modelled	% Difference
TF27	1.30	29.0	24.6	-15.3%
DT84	1.30	12.0	13.2	9.8%
DT36	1.30	11.0	13.6	23.7%
DT35	1.30	17.0	17.6	3.5%
DT64	1.30	13.0	14.1	8.4%
DT60	1.30	17.0	16.2	-4.8%
DT59	1.30	15.0	15.6	3.9%
TF21	1.30	15.0	18.1	20.4%
TF36	1.29	31.0	28.7	-7.5%
S3	3.41	62.3	57.2	-8.2%
S4	3.41	48.4	54.6	12.7%

Root Mean Square Error (RMSE) is used to define the average error or uncertainty of the model. According to LAQM.TG(22), the RMSE should ideally be within 10% of the relevant AQS, but is acceptable where it is within 25% of the AQS.

Comparison of the post-adjusted modelled and monitored NO_2 concentrations at local monitoring sites resulted in the calculation of an RMSE of 2.4 $\mu g.m^{-3}$, which equates to 6% with respect to the annual mean AQS and is therefore within the 'ideal' 10% range.

As there is no roadside monitoring for PM_{10} or $PM_{2.5}$ in the modelled domain, it was not possible to perform model verification for these pollutants. As such, the NO_2 adjustment factor has also been applied to PM_{10} and $PM_{2.5}$ model results, in accordance with LAQM.TG(22).

The adjustment factor has also been used for NO_X in the assessment of ecological sites. Noting that all monitoring locations considered in the model verification were within a few meters of the roadside, the verification process enables a reasonable level of confidence in the performance of the model when considering receptors closest to the road. However, ecological receptor transects extend up to 200m away from the roadside, often through dense woodland which is likely to inhibit pollutant dispersion. In the absence of data to verify the performance of the model in such situations, it was decided to proceed with NO_X adjustment for ecological receptors, for conservatism.

Tables 4.4.5 and Table 4.4.6 include the adjustment factors applied to each of the modelled human and ecological receptors. The chosen adjustment factor corresponds to the area in which each receptor is located.

Consideration of Project-Specific Diffusion Tube Monitoring Survey

BWB Consulting Limited undertook two separate diffusion tube monitoring surveys, in 2021/2020 and in 2025, at locations across Ardley, Middleton Stoney, Upper Hayford, Bicester and Weston-on-the-Green.

Neither of these diffusion tube monitoring survey results can be used directly in the model verification, as the model verification should ideally be undertaken using monitoring data, background estimates, meteorological data and traffic data from the same year. At the time of assessment, meteorological data for 2025 was not available, and the baseline traffic data was all based in the year 2024.

However, the 2025 monitoring data can be used to further validate the appropriateness of the use of NO_X adjustment factors, on the expectation that 2025 monitored concentrations are unlikely to be materially different to 2024 monitored concentrations.

Table 4.4.3 below further highlights that the selected adjustment factors are suitable as, following adjustment, all BWB monitoring sites were modelled to be within 25% of monitored concentrations.

Table 4.4.3: Monitored and Adjusted Modelled NO_2 Concentrations at BWB's Monitoring Sites

Monitor	Adjustment Factor	Annual Mean NO_2 Concentrations ($\mu g.m^{-3}$)		
		Monitored	Modelled	% Difference
Weston 1	1.97	13.3	11.7	-11.7%
Ardley 1	1.00	15.8	15.0	-5.0%
Ardley 2	1.00	11.2	11.7	4.3%
Ardley 3	1.00	15.2	14.2	-6.6%
MS 1/2/3	1.97	13.1	13.1	-0.2%
Bicester 1	1.97	17.4	16.2	-7.0%
UH 2	1.97	14.6	11.5	-21.6%

Modelling Inputs

To assess the impact of road traffic emissions on air quality at existing and proposed sensitive receptor locations, and to consider levels of air pollution across the Application Site, emissions from local roads were simulated using the ADMS-Roads model (version 5.1.0.2). This model was developed by Cambridge Environmental Research Consultants and has been validated and approved for use as a tool in calculating emissions and dispersion of pollutants from road traffic in the UK by DEFRA.

The inputs used within the ADMS-Roads dispersion modelling assessment are outlined below.

Traffic Inputs

Traffic Flows

The traffic inputs used within the ADMS-Roads assessment of the Proposed Development's impact on local air quality, from both the construction and operational phases, were provided by the Project Transport Consultants; ADC Infrastructure Limited.

These traffic data were sourced from the BTM, and provided in annual average daily traffic (AADT) flow format for comparison with relevant screening thresholds and integration into the air quality dispersion modelling.

Beyond the extent of the BTM domain, additional traffic data for relevant roads within surrounding AQMAs, including CDC AQMA No.1 (Banbury), Botley AQMA and Oxford AQMA were provided by ADC Infrastructure Limited, based on DfT traffic count data[5].

Traffic data were provided in 24-hour AADT format for a total of twelve assessment scenarios, as outlined in **ES Chapter 4: Air Quality and Odour**, Section 4.2.74.

Further details regarding the preparation of traffic data are available in **ES Chapter 3: Transport**.

Traffic Speeds

Traffic speeds were selected based on professional judgement, taking into account speed limits, estimated road speeds from the BTM, congestion from live traffic sources such as Google traffic and the presence of junctions and other features which may cause traffic to slow. Based on consideration of each of these factors, traffic speeds were estimated for use within the air quality dispersion modelling.

On sections of roads where traffic was expected to be free-flowing, speeds were generally modelled at the posted speed limit. Exceptions were applied to motorways, which were modelled at 60mph to reflect typical average speeds, and to narrow rural lanes subject to the national speed limit, which were modelled at 30 – 40 mph to reflect realistic driving conditions.

Road junctions were modelled in line with guidance from LAQM.TG(22)[1], by applying reductions in speeds to account for slowing, queuing and congestion. Traffic speeds at, and adjacent to, junctions were typically modelled at speeds ranging from 15 mph 30 mph, based on applicable speed limits and professional judgement.

Heavily congested areas were identified using live traffic resources. In such areas, reductions in traffic speeds were also applied to reflect congestion and queuing.

Vehicle Emission Factors

Emission factors for road traffic were obtained from the latest available DEFRA Emissions Factors Toolkit (v 13.1)[6]. The appropriate emission factor year was used for each assessment year, to account for the forecast improvement in vehicle emissions over time.

Meteorological Data

Detailed, hourly sequential, meteorological data are used in the model to determine pollutant transportation and levels of dilution by the wind and vertical air movements. Meteorological data used in the model were obtained from the Weston-on-the-Green recording station, as this was located within the study area and is thus considered the most representative recording station for conditions within the study area. The meteorological data used in the air quality modelling were from the year 2024. However, meteorological data from the same monitoring station for the years 2020 to 2024, inclusive, were used within the Odour modelling assessment.

The wind roses for these meteorological datasets are provided in Figure 4.4.5, below.

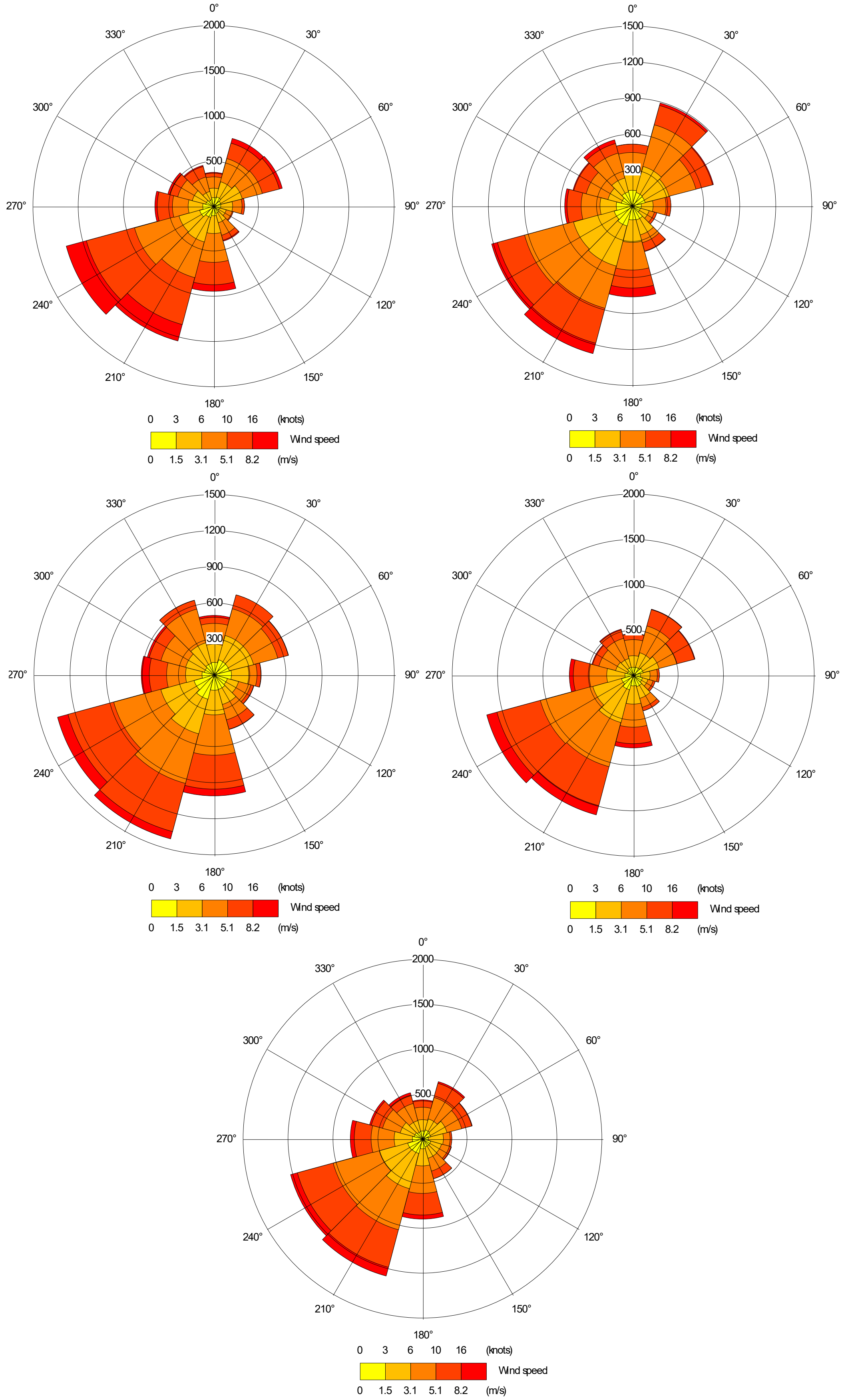
<u>Surface Roughness</u>

Surface roughness is used within the dispersion modelling to reflect the dispersion characteristics of the study area. Due to the wide spatial extent of the traffic modelling, spatially varying surface roughness parameters were used to represent the variety of physical environments across the model area. Surface roughness values ranged from 0.5m (the typical value for 'parkland' and 'open suburbia') through to 1.0m (the typical value for cities and woodland), with increased surface roughness values applied in the more urbanised areas of Oxford, Bicester and Banbury.

The surface roughness applied to the meteorological measurement site was 0.3m, to reflect its more open location.

6 DEFRA (2025). *Emissions Factors Toolkit (version 13.1)*. Available from: https://laqm.defra.gov.uk/air-quality/air-quality-assessment/emissions-factors-toolkit/

Figure 4.4.5: Wind Roses for Weston-on-the-Green (2020 – 2024)



Street Canyons

Where buildings on one or both sides of a road act to form a physical barrier which may limit the dispersion of pollution, these have been replicated through the modelling using advanced street canyons. The characteristics of street canyons (i.e. canyon width, building height, building length) have been measured and defined using Google Earth 3-D imagery. Street canyons have been included within the modelling, where appropriate, across the study area.

ADMS-Roads Model Inputs

A summary of the ADMS-Roads model inputs used within this assessment is provided in Table 4.4.4, below.

Table 4.4.4: ADMS-Roads Model Input Parameters

Model Parameter	Model Verification, Base and 'Peak' Construction Year (2024)	Opening Year With and Without Development (2031)	Completion Year With and Without Development (2034)	End of Local Plan Period With and Without Development (2042)
Emissions Dataset	Defra Emission Factor Toolkit v12.1 (2VC)			
Emission Year	2024	2031	2034	2040
Road Type	England (Motorway) applied for M40 and England (Urban) for all other roads			
Advanced Input Parameters	Advanced Street Canyon Tool used to reflect locations at which buildings on either or both sides of a road form a physical barrier which may inhibit the dispersion of pollutants.			

Modelled Air Quality Receptors

The receptors modelled in this assessment correspond to all sensitive locations closest to the Proposed Development's affected road network. Receptors are, therefore, positioned in worst-case locations, for a conservative approach. Receptors were modelled at "breathing height", which is, by convention, 1.5m above ground level for all receptors except schools, nurseries and children's play areas, where a value of 1.0m was used, to reflect the shorter breathing height of children.

Human Receptors

Details of the human receptor locations modelled within the construction and operational phase traffic modelling assessments are provided in Table 4.4.5, below.

Table 4.4.5: Modelled Human Receptors

Receptor ID	Receptor Description	Receptor Location (UK Grid Reference (m))			Applied NO_X Adjustment Factor
		X	Y	Z	
R1	Residence - B430 Station Rd	454239.3	226990.1	1.50	1.00
R2	Jersey Cottage - B430 Station Rd	454247.4	227250.6	1.50	1.00
R3	Residence - Church Rd	454211.9	227347.8	1.50	1.00
R4	Residence - Somerton Rd	454265.2	227444.1	1.50	1.00
R5	Residence - The Crossways	454300.0	227499.0	1.50	1.00
R6	Residence - Ardley Rd	454334.9	227523.4	1.50	1.00
R7	Residence - Water St	451679.9	228014.4	1.50	1.00
R8	Residence - Somerton Rd	449810.2	228689.9	1.50	1.97
R9	Residence - Somerton Rd	447837.0	229085.2	1.50	1.97
R10	Residence - A4260 Oxford Rd	447802.5	229027.8	1.50	1.97
R11	Residence - A4260 New St	446963.4	228667.0	1.50	1.97
R12	Residence - A4260 New St	446777.9	231278.1	1.50	1.97
R13	Residence - A4260 High St	446714.0	231315.2	1.50	1.97
R14	Residence - A4260 High St	446569.3	231696.6	1.50	1.97
R15	Deddinton CofE Primary School	446559.2	231717.2	1.50	1.97
R16	Grimsbury Nursery School	446612.7	231879.9	1.00	1.97
R17	Residence - A422 Hennef Way	446657.5	232185.6	1.50	1.97
R18	Residence - Horton Dr	454205.8	227933.2	1.50	1.00
R19	Residence - A422 Main Rd	452795.8	229307.5	1.50	1.00
R20	Residence - B4031	452658.1	231191.7	1.50	1.97
R21	Residence - Ambury Rd	452624.3	231279.5	1.50	1.97
R22	Residence - B4100	452170.6	225698.8	1.50	1.97
R23	Residence - B4100 (South of Hillside)	451933.4	225720.0	1.50	1.97
R24	Residence - East St	450925.8	225851.2	1.50	1.97
R25	Residence - Fritwell Rd	450688.0	225858.0	1.50	1.97
R26	Residence - Featherbed Ln	450056.3	225157.7	1.50	1.97
R27	Residence - A421	449934.4	223525.2	1.50	1.97
R28	Residence - Toll Gate St	453394.9	223610.7	1.50	1.97
R29	Residence - A4421	453398.2	223517.3	1.50	1.97
R30	Residence - A4421 Newton Purcell	453432.3	223486.9	1.50	1.97
R31	Residence - A4421	453514.9	223472.2	1.50	1.97

Receptor ID	Receptor Description	Receptor Location (UK Grid Reference (m))			Applied NO_X Adjustment Factor
		X	Y	Z	
R32	Residence - Juniper Gardens	455423.7	223134.5	1.50	1.97
R33	Residence - Orchard Walk	456462.8	222702.6	1.50	1.97
R34	Residence - Bainton Rd	456342.1	222283.0	1.50	1.97
R35	Residence - Bicester Rd	456927.2	222628.5	1.50	1.97
R36	Residence - B4100	456934.6	222448.3	1.50	1.97
R37	Residence - Ardley Rd	457212.6	222481.1	1.50	1.97
R38	Residence - M40	457652.6	222325.3	1.50	1.97
R39	Residence - Middleton Rd	457887.0	222229.6	1.50	1.97
R40	Residence - B4030	458022.6	222432.9	1.50	1.97
R41	Residence - B4030 Bicester Rd	458221.6	222800.3	1.50	1.97
R42	Residence - B430 Ardley Rd	458303.1	222726.1	1.50	1.97
R43	Residence - B430 Ardley Rd	457787.0	223214.0	1.50	1.97
R44	Residence - B4030 Heyford Rd	457272.0	223099.9	1.50	1.97
R45	Residence - North of Camp Rd	458255.2	223624.4	1.50	1.97
R46	Residence - Kirtlington Rd	458209.2	224461.6	1.50	1.97
R47	Residence - Port Way	458111.4	224647.1	1.50	1.97
R48	Residence - A4095 West of Chesterton	456886.9	224364.9	1.50	1.97
R49	Residence - A4095 Kirtlington	455822.3	225503.0	1.50	1.00
R50	Residence - A4095 Heyford Rd	455975.1	225580.8	1.50	1.00
R51	Kirtlington CofE Primary School	456305.2	225738.2	1.50	1.00
R52	Residence - A4095 Heyford Rd	457247.0	226302.9	1.50	1.00
R53	Residence - A4095 Lince Ln	454858.2	227251.2	1.50	1.00
R54	Residence - B430 Northampton Rd	454981.1	227110.5	1.50	1.00
R55	Residence - B430 Northampton Rd	454716.2	229238.4	1.50	1.97
R56	Residence - B430 Northampton Rd	455035.6	229642.7	1.50	1.97
R57	Residence - Church Rd	457602.2	233421.5	1.50	1.97
R58	Residence - B4027 Station Rd	461287.9	233178.7	1.50	1.97
R59	Residence - B4027 Station Rd	463199.7	232812.3	1.50	1.97
R60	Residence - A4095 Bunkers Hill	466121.8	232697.2	1.50	1.97
R61	Residence - A4260 Banbury Rd	463046.0	231371.3	1.50	1.97
R62	Mobile Home - Manor Park	462797.2	231109.5	1.50	1.97
R63	Residence - A34	461306.8	228619.6	1.50	1.97

Receptor ID	Receptor Description	Receptor Location (UK Grid Reference (m))			Applied NO_X Adjustment Factor
		X	Y	Z	
R64	Residence - A41	459212.6	224883.7	1.50	1.97
R65	Residence - B4030 Vendee Dr	454297.8	222120.7	1.50	1.97
R66	Residence - Colwell Close	455873.9	219730.0	1.50	1.97
R67	Residence - Oxford Rd	458806.0	221474.7	1.50	1.97
R68	Residence - Middleton Stoney Rd	459159.3	221276.8	1.50	1.97
R69	Residence - Middleton Stoney Rd	459823.8	220650.9	1.50	1.97
R70	Residence - Shakespeare Drive	461220.6	220385.9	1.50	1.97
R71	Residence - Whitelands Way	465334.9	219826.0	1.50	1.97
R72	Residence - Blenheim Dr	468985.0	219057.7	1.50	1.97
R73	Residence - Hudson St	463599.9	221980.3	1.50	1.97
R74	Residence - B4100 Banbury Rd	464119.6	222726.0	1.50	1.97
R75	Residence - Kings End	464792.7	223335.2	1.50	1.97
R76	Residence - St John's St	453354.6	218781.4	1.50	1.97
R77	Residence - A4421	453236.0	218663.1	1.50	1.97
R78	Residence - B4100 London Rd	453673.8	217945.5	1.50	1.97
R79	Residence - B4100 London Rd	453710.4	217843.9	1.50	1.97
R80	Residence - A41	453005.2	216814.2	1.50	1.97
R81	Residence - A41	449997.3	219950.9	1.50	1.97
R82	Residence - Marsh Gibbon	450001.3	219777.9	1.50	1.97
R83	Residence - Townsend	450028.2	219751.8	1.00	1.97
R84	Residence - Station Rd	449923.7	219620.4	1.50	1.97
R85	Residence - A41	448307.4	218128.4	1.50	1.97
R86	Residence - A41	449920.8	217765.1	1.50	1.97
R87	Residence B4100 (North of Hillside)	450223.4	217613.0	1.50	1.97
R88	Residence - Bucknell Road	447305.2	217692.5	1.50	1.97
R89	Residence - 25/02190/HYBRID	447531.4	216719.0	1.50	1.97
R90	Residence - 23/02096/OUT	451333.4	214872.0	1.50	1.97
R91	Residence - 22/03063/F	453485.8	239729.9	1.50	1.97
R92	Residence - Ardley Rd / Station Rd Jct	450483.3	241385.2	1.50	1.97
R93	Residence - South of Camp Road	446572.0	241724.0	1.50	3.41
R94	Residence - St Johns Street	446257.0	241710.0	1.50	3.41
R95	Residence - North of A34 Southern Bypass	448896.0	205829.0	1.50	1.30

Receptor ID	Receptor Description	Receptor Location (UK Grid Reference (m))			Applied NO_X Adjustment Factor
		X	Y	Z	
R96	Residence - South of A34 Southern Bypass	448863.0	205806.0	1.50	1.30
R97	Residence - East of Yarnells Road	449013.0	205719.0	1.50	1.30
R98	Residence - A420 Botley Road	449666.0	206247.0	1.50	1.30
R99	Residence - A420 Botley Road	450050.0	206206.0	1.50	1.30
R100	Residence - Hollybush Row	450691.0	206105.0	1.50	1.30
R101	Residence - Thames St	451223.0	205723.0	1.50	1.30
R102	Residence - Headley Way	453729.0	207216.0	1.50	1.30
R103	Residence - Headley Way	453461.0	207574.0	1.50	1.30
R104	Mobile Home - St Nicholas Park	452586.0	209233.0	1.50	1.30
R105	Cuttleslowe Primary School	451073.0	210165.0	1.00	1.30
R106	Residence - Holt Weer Close	450897.0	210229.0	1.50	1.30
R107	Residence - A40 North Way	450193.0	210185.0	1.50	1.30
R108	Residence - A40 North Way	449851.0	210207.0	1.50	1.30
R109	Residence - Woodstock Road	449688.0	210267.0	1.50	1.30
R110	Residence - 22/00675/RES	449440.0	210234.0	1.50	1.30

Ecological Receptors

Details of the modelled ecological receptors are provided in the below table. The values at the end of each Receptor ID correspond to the distances (m) from the road of each receptor point within each modelled transect.

Table 4.4.6: Modelled Ecological Receptors

Receptor ID	Receptor Description	Receptor Location (UK Grid Reference (m))			Applied NO_X Adjustment Factor
		X	Y	Z	
ECO1_A_10	Ardley Cutting and Quarry SSSI	452977	227727	0	1.00
ECO1_A_20	Ardley Cutting and Quarry SSSI	452965	227739	0	1.00
ECO1_A_30	Ardley Cutting and Quarry SSSI	452951	227751	0	1.00
ECO1_A_40	Ardley Cutting and Quarry SSSI	452934	227764	0	1.00
ECO1_A_50	Ardley Cutting and Quarry SSSI	452919	227776	0	1.00
ECO1_A_75	Ardley Cutting and Quarry SSSI	452882	227807	0	1.00
ECO1_A_100	Ardley Cutting and Quarry SSSI	452846	227837	0	1.00
ECO1_A_150	Ardley Cutting and Quarry SSSI	452769	227898	0	1.00

Receptor ID	Receptor Description	Receptor Location (UK Grid Reference (m))			Applied NO_x Adjustment Factor
		X	Y	Z	
ECO1_A_200	Ardley Cutting and Quarry SSSI	452689	227965	0	1.00
ECO1_B_10	Ardley Cutting and Quarry SSSI	452962	227709	0	1.00
ECO1_B_20	Ardley Cutting and Quarry SSSI	452978	227697	0	1.00
ECO1_B_30	Ardley Cutting and Quarry SSSI	452992	227685	0	1.00
ECO1_B_40	Ardley Cutting and Quarry SSSI	453007	227673	0	1.00
ECO1_B_50	Ardley Cutting and Quarry SSSI	453023	227660	0	1.00
ECO1_B_75	Ardley Cutting and Quarry SSSI	453074	227619	0	1.00
ECO1_B_100	Ardley Cutting and Quarry SSSI	453137	227571	0	1.00
ECO1_B_150	Ardley Cutting and Quarry SSSI	453260	227459	0	1.00
ECO1_B_200	Ardley Cutting and Quarry SSSI	453350	227385	0	1.00
ECO1_C_10	Ardley Cutting and Quarry SSSI	454080	226731	0	1.00
ECO1_C_20	Ardley Cutting and Quarry SSSI	454072	226737	0	1.00
ECO1_C_30	Ardley Cutting and Quarry SSSI	454064	226743	0	1.00
ECO1_C_40	Ardley Cutting and Quarry SSSI	454055	226750	0	1.00
ECO1_C_50	Ardley Cutting and Quarry SSSI	454048	226757	0	1.00
ECO1_C_75	Ardley Cutting and Quarry SSSI	454028	226774	0	1.00
ECO1_C_100	Ardley Cutting and Quarry SSSI	454009	226792	0	1.00
ECO1_C_150	Ardley Cutting and Quarry SSSI	453971	226828	0	1.00
ECO1_C_200	Ardley Cutting and Quarry SSSI	453934	226867	0	1.00
ECO1_D_10	Ardley Cutting and Quarry SSSI	454110	226734	0	1.00
ECO1_D_20	Ardley Cutting and Quarry SSSI	454118	226727	0	1.00
ECO1_D_30	Ardley Cutting and Quarry SSSI	454125	226720	0	1.00
ECO1_D_40	Ardley Cutting and Quarry SSSI	454133	226713	0	1.00
ECO1_D_50	Ardley Cutting and Quarry SSSI	454141	226706	0	1.00
ECO1_E_10	Ardley Cutting and Quarry SSSI	454184	226666	0	1.00
ECO1_E_20	Ardley Cutting and Quarry SSSI	454176	226673	0	1.00
ECO1_E_30	Ardley Cutting and Quarry SSSI	454169	226681	0	1.00
ECO1_E_40	Ardley Cutting and Quarry SSSI	454161	226688	0	1.00
ECO1_E_50	Ardley Cutting and Quarry SSSI	454155	226695	0	1.00
ECO1_F_10	Ardley Cutting and Quarry SSSI	454188	226628	0	1.00
ECO1_F_20	Ardley Cutting and Quarry SSSI	454195	226621	0	1.00
ECO1_F_30	Ardley Cutting and Quarry SSSI	454202	226613	0	1.00

Receptor ID	Receptor Description	Receptor Location (UK Grid Reference (m))			Applied NO_x Adjustment Factor
		X	Y	Z	
ECO1_F_40	Ardley Cutting and Quarry SSSI	454210	226606	0	1.00
ECO1_F_50	Ardley Cutting and Quarry SSSI	454218	226599	0	1.00
ECO1_F_75	Ardley Cutting and Quarry SSSI	454237	226581	0	1.00
ECO1_F_100	Ardley Cutting and Quarry SSSI	454256	226563	0	1.00
ECO1_F_150	Ardley Cutting and Quarry SSSI	454294	226527	0	1.00
ECO1_F_200	Ardley Cutting and Quarry SSSI	454332	226491	0	1.00
ECO1_G_10	Ardley Cutting and Quarry SSSI	454949	225936	0	1.00
ECO1_G_20	Ardley Cutting and Quarry SSSI	454939	225945	0	1.00
ECO1_G_30	Ardley Cutting and Quarry SSSI	454929	225954	0	1.00
ECO1_G_40	Ardley Cutting and Quarry SSSI	454919	225962	0	1.00
ECO1_G_50	Ardley Cutting and Quarry SSSI	454909	225970	0	1.00
ECO1_G_75	Ardley Cutting and Quarry SSSI	454884	225994	0	1.00
ECO1_G_100	Ardley Cutting and Quarry SSSI	454859	226016	0	1.00
ECO1_G_150	Ardley Cutting and Quarry SSSI	454810	226060	0	1.00
ECO1_G_200	Ardley Cutting and Quarry SSSI	454760	226109	0	1.00
ECO1_H_10	Ardley Cutting and Quarry SSSI	454994	225861	0	1.00
ECO1_H_20	Ardley Cutting and Quarry SSSI	455004	225852	0	1.00
ECO1_H_30	Ardley Cutting and Quarry SSSI	455014	225843	0	1.00
ECO1_H_40	Ardley Cutting and Quarry SSSI	455023	225834	0	1.00
ECO1_H_50	Ardley Cutting and Quarry SSSI	455033	225823	0	1.00
ECO1_H_75	Ardley Cutting and Quarry SSSI	455057	225800	0	1.00
ECO1_H_100	Ardley Cutting and Quarry SSSI	455082	225777	0	1.00
ECO1_H_150	Ardley Cutting and Quarry SSSI	455130	225732	0	1.00
ECO1_H_200	Ardley Cutting and Quarry SSSI	455179	225691	0	1.00
ECO2_A_15	Ardley Fields Quarry LWS	454948	226276	0	1.00
ECO2_A_25	Ardley Fields Quarry LWS	454938	226276	0	1.00
ECO2_A_35	Ardley Fields Quarry LWS	454928	226276	0	1.00
ECO2_A_45	Ardley Fields Quarry LWS	454918	226275	0	1.00
ECO2_A_55	Ardley Fields Quarry LWS	454908	226275	0	1.00
ECO2_A_80	Ardley Fields Quarry LWS	454883	226274	0	1.00
ECO2_A_105	Ardley Fields Quarry LWS	454858	226274	0	1.00
ECO2_A_155	Ardley Fields Quarry LWS	454808	226272	0	1.00

Receptor ID	Receptor Description	Receptor Location (UK Grid Reference (m))			Applied NO_x Adjustment Factor
		X	Y	Z	
ECO3_A	Burntclose Copse AW	453872	223854	0	1.97
ECO3_B_	Burntclose Copse AW	453873	223754	0	1.97
ECO3_C_	Burntclose Copse AW	453881	223639	0	1.97
ECO4_A_10	Digging Copse AW	455456	226246	0	1.00
ECO4_A_20	Digging Copse AW	455449	226239	0	1.00
ECO4_A_30	Digging Copse AW	455442	226232	0	1.00
ECO4_A_40	Digging Copse AW	455435	226224	0	1.00
ECO4_A_50	Digging Copse AW	455428	226217	0	1.00
ECO4_A_75	Digging Copse AW	455410	226200	0	1.00
ECO4_A_100	Digging Copse AW	455393	226182	0	1.00
ECO5_A_125	Graven Hill Wetlands Proposed DWS	458580	221395	0	1.97
ECO5_A_150	Graven Hill Wetlands Proposed DWS	458574	221377	0	1.97
ECO5_A_200	Graven Hill Wetlands Proposed DWS	458553	221331	0	1.97
ECO6_A_10	Ham Home-cum-Hamgreen Woods SSSI	469644	218629	0	1.97
ECO6_A_20	Ham Home-cum-Hamgreen Woods SSSI	469648	218639	0	1.97
ECO6_A_30	Ham Home-cum-Hamgreen Woods SSSI	469651	218650	0	1.97
ECO6_A_40	Ham Home-cum-Hamgreen Woods SSSI	469655	218660	0	1.97
ECO6_A_50	Ham Home-cum-Hamgreen Woods SSSI	469659	218671	0	1.97
ECO6_A_75	Ham Home-cum-Hamgreen Woods SSSI	469669	218696	0	1.97
ECO6_A_100	Ham Home-cum-Hamgreen Woods SSSI	469680	218720	0	1.97
ECO6_A_150	Ham Home-cum-Hamgreen Woods SSSI	469706	218764	0	1.97
ECO6_A_200	Ham Home-cum-Hamgreen Woods SSSI	469728	218812	0	1.97
ECO7_A_150	Long Herdon Meadow SSSI	464797	220017	0	1.97
ECO7_A_200	Long Herdon Meadow SSSI	464801	220067	0	1.97
ECO8_A_10	Meizen Copse AW	454598	218545	0	1.97
ECO8_A_20	Meizen Copse AW	454590	218551	0	1.97
ECO8_A_30	Meizen Copse AW	454583	218558	0	1.97
ECO8_A_40	Meizen Copse AW	454575	218564	0	1.97
ECO8_A_50	Meizen Copse AW	454567	218571	0	1.97

Receptor ID	Receptor Description	Receptor Location (UK Grid Reference (m))			Applied NO_x Adjustment Factor
		X	Y	Z	
ECO8_A_75	Meizen Copse AW	454549	218588	0	1.97
ECO8_B_10	Meizen Copse AW	454602	218490	0	1.97
ECO8_B_20	Meizen Copse AW	454609	218484	0	1.97
ECO8_B_30	Meizen Copse AW	454617	218477	0	1.97
ECO8_B_40	Meizen Copse AW	454625	218471	0	1.97
ECO8_B_50	Meizen Copse AW	454632	218464	0	1.97
ECO8_B_75	Meizen Copse AW	454651	218448	0	1.97
ECO8_B_100	Meizen Copse AW	454669	218431	0	1.97
ECO9_A_15	Shabbington Woods Complex SSSI	463124	210653	0	1.97
ECO9_A_25	Shabbington Woods Complex SSSI	463114	210654	0	1.97
ECO9_A_35	Shabbington Woods Complex SSSI	463104	210654	0	1.97
ECO9_A_45	Shabbington Woods Complex SSSI	463094	210655	0	1.97
ECO9_A_55	Shabbington Woods Complex SSSI	463084	210656	0	1.97
ECO9_A_80	Shabbington Woods Complex SSSI	463059	210657	0	1.97
ECO9_A_105	Shabbington Woods Complex SSSI	463034	210659	0	1.97
ECO9_A_155	Shabbington Woods Complex SSSI	462984	210660	0	1.97
ECO9_A_205	Shabbington Woods Complex SSSI	462934	210662	0	1.97
ECO9_B_10	Shabbington Woods Complex SSSI	463184	210625	0	1.97
ECO9_B_20	Shabbington Woods Complex SSSI	463194	210624	0	1.97
ECO9_B_30	Shabbington Woods Complex SSSI	463204	210623	0	1.97
ECO9_B_40	Shabbington Woods Complex SSSI	463214	210623	0	1.97
ECO10_A_30	Stoke Little Wood AW	456329	227513	0	1.00
ECO10_A_40	Stoke Little Wood AW	456337	227519	0	1.00
ECO10_A_50	Stoke Little Wood AW	456346	227524	0	1.00
ECO10_A_60	Stoke Little Wood AW	456354	227529	0	1.00
ECO10_A_70	Stoke Little Wood AW	456363	227535	0	1.00
ECO10_A_95	Stoke Little Wood AW	456384	227548	0	1.00
ECO10_A_120	Stoke Little Wood AW	456405	227561	0	1.00
ECO10_A_170	Stoke Little Wood AW	456449	227585	0	1.00
ECO11_A_15	Trow Pool LWS	454877	224814	0	1.00
ECO11_A_25	Trow Pool LWS	454868	224817	0	1.00
ECO11_A_35	Trow Pool LWS	454858	224820	0	1.00

Receptor ID	Receptor Description	Receptor Location (UK Grid Reference (m))			Applied NO_x Adjustment Factor
		X	Y	Z	
ECO11_A_45	Trow Pool LWS	454848	224823	0	1.00
ECO11_A_55	Trow Pool LWS	454839	224828	0	1.00
ECO11_A_80	Trow Pool LWS	454815	224838	0	1.00
ECO11_A_105	Trow Pool LWS	454790	224848	0	1.00
ECO11_A_155	Trow Pool LWS	454742	224868	0	1.00
ECO11_A_205	Trow Pool LWS	454694	224886	0	1.00
ECO12_A_10	Twelveacre Copse AW	456797	226695	0	1.00
ECO12_A_20	Twelveacre Copse AW	456793	226685	0	1.00
ECO12_A_30	Twelveacre Copse AW	456788	226676	0	1.00
ECO12_A_40	Twelveacre Copse AW	456784	226666	0	1.00
ECO12_A_50	Twelveacre Copse AW	456779	226657	0	1.00
ECO12_A_75	Twelveacre Copse AW	456768	226633	0	1.00
ECO12_A_100	Twelveacre Copse AW	456758	226607	0	1.00
ECO12_A_150	Twelveacre Copse AW	456733	226562	0	1.00
ECO12_A_200	Twelveacre Copse AW	456710	226514	0	1.00
ECO13_A_125	Unnamed - Adj to Magnolia Park AW	461459	214635	0	1.97
ECO13_A_150	Unnamed - Adj to Magnolia Park AW	461478	214649	0	1.97
ECO13_A_200	Unnamed - Adj to Magnolia Park AW	461521	214675	0	1.97
ECO14_A_50	Unnamed - Adj to Rowles Farm Solar Park AW	452943	216711	0	1.97
ECO14_A_75	Unnamed - Adj to Rowles Farm Solar Park AW	452963	216695	0	1.97
ECO15_A_20	Unnamed Trixax Park Oxford AW	455196	219567	0	1.97
ECO15_A_30	Unnamed Trixax Park Oxford AW	455205	219569	0	1.97
ECO15_A_40	Unnamed Trixax Park Oxford AW	455215	219571	0	1.97
ECO15_A_50	Unnamed Trixax Park Oxford AW	455225	219573	0	1.97
ECO15_A_75	Unnamed Trixax Park Oxford AW	455250	219578	0	1.97
ECO15_A_100	Unnamed Trixax Park Oxford AW	455274	219584	0	1.97
ECO16_A_30	Wendlebury Meads and Mansmoor Closes SSSI	456624	217741	0	1.97
ECO16_A_40	Wendlebury Meads and Mansmoor Closes SSSI	456616	217735	0	1.97
ECO16_A_50	Wendlebury Meads and Mansmoor Closes SSSI	456608	217729	0	1.97
ECO16_A_75	Wendlebury Meads and Mansmoor Closes SSSI	456587	217715	0	1.97

Receptor ID	Receptor Description	Receptor Location (UK Grid Reference (m))			Applied NO_x Adjustment Factor
		X	Y	Z	
ECO16_A_100	Wendlebury Meads and Mansmoor Closes SSSI	456567	217700	0	1.97
ECO16_A_150	Wendlebury Meads and Mansmoor Closes SSSI	456524	217673	0	1.97
ECO16_A_200	Wendlebury Meads and Mansmoor Closes SSSI	456482	217646	0	1.97
ECO17_A_10	Oxford Meadows SAC	448546	210004	0	1.29
ECO17_A_20	Oxford Meadows SAC	448538	210011	0	1.29
ECO17_A_30	Oxford Meadows SAC	448530	210018	0	1.29
ECO17_A_40	Oxford Meadows SAC	448522	210027	0	1.29
ECO17_A_50	Oxford Meadows SAC	448514	210034	0	1.29
ECO17_A_75	Oxford Meadows SAC	448499	210048	0	1.29
ECO17_A_100	Oxford Meadows SAC	448480	210066	0	1.29
ECO17_A_150	Oxford Meadows SAC	448444	210102	0	1.29
ECO17_A_200	Oxford Meadows SAC	448406	210133	0	1.29
ECO17_B_10	Oxford Meadows SAC	448445	209817	0	1.29
ECO17_B_20	Oxford Meadows SAC	448454	209810	0	1.29
ECO17_B_30	Oxford Meadows SAC	448462	209803	0	1.29
ECO17_B_40	Oxford Meadows SAC	448471	209795	0	1.29
ECO17_B_50	Oxford Meadows SAC	448479	209788	0	1.29
ECO17_B_75	Oxford Meadows SAC	448495	209776	0	1.29
ECO17_B_100	Oxford Meadows SAC	448516	209759	0	1.29
ECO17_B_150	Oxford Meadows SAC	448554	209726	0	1.29
ECO17_B_200	Oxford Meadows SAC	448595	209697	0	1.29
ECO17_C_10	Oxford Meadows SAC	447774	210700	0	1.29
ECO17_C_20	Oxford Meadows SAC	447774	210690	0	1.29
ECO17_C_30	Oxford Meadows SAC	447774	210679	0	1.29
ECO17_C_40	Oxford Meadows SAC	447774	210667	0	1.29
ECO17_C_50	Oxford Meadows SAC	447774	210656	0	1.29
ECO17_C_75	Oxford Meadows SAC	447774	210636	0	1.29
ECO17_C_100	Oxford Meadows SAC	447774	210609	0	1.29
ECO17_C_150	Oxford Meadows SAC	447774	210559	0	1.29
ECO17_C_200	Oxford Meadows SAC	447777	210509	0	1.29

Modelled Odour Sources

Landfill Odour Source Areas

It is proposed that the excavation of capped wastes will be undertaken sequentially, with small parcels of land being worked at any one time. This will minimise the size/surface area of the odour sources. As each parcel is completed, it will be covered with capping materials before the next parcel is worked on.

At present, it is understood that the partial excavation of the landfill is likely to be undertaken in **five** separate phases. The Project Landfill Engineers have provided a concept plan for phasing activities, which has been used in the odour dispersion modelling exercise.

The five phases have been depicted in Figures 4.28 to 4.32. For conservatism, modelled source areas have been assumed to cover the maximum excavation area and maximum relocated waste area for the full duration of each phase.

Landfill Odour Emissions Library Data

As mentioned in **ES Chapter 4: Air Quality and Odour**, there is appreciable uncertainty associated with emission rates from landfill sites. As such, a conservative emission profile for the landfill waste has been obtained from a review of published emissions data.

A total of 50 odour emission rates were collated into a database from several publicly available data sources; whereby site-specific municipal waste landfill odour emission samples were obtained. Details of these emission rates are provided below.

Modelled Odour Receptors

Details of the receptor locations modelled within the Odour Assessment are provided in Table 4.6 of **ES Chapter 4: Air Quality and Odour** and are shown in Figure 4.26.

Table 4.4.7: Library Emission Rates for Active Landfill Cells

Library Source	Odour Emission Rate (OU/m^2/s)
Sarkar, U. (1999). *Odour Nuisance from Solid Wastes: Development of a Model describing Emission, Dispersion and Reception*. Cranford University.	1.0
	8.0
Arpley Landfill: Michael Bull & Associates (2025). *Odour emissions database (August 2025).* Available from: https://www.odourconsultant.co.uk/odour-emissions-database/	0.3
	0.4
	0.5
Bletchley Landfill: Michael Bull & Associates (2025). *Odour emissions database (August 2025).* Available from: https://www.odourconsultant.co.uk/odour-emissions-database/	9.4
	236.41
Tonkin & Taylor (2020). *Bluegums Landfill Odour Modelling Assessment*. Available from: https://www.marlborough.govt.nz/repository/libraries/id:2ifzri1o01cxbymxkvwz/hierarchy/documents/services/recycling-and-waste/bluegums-landfill/bluegums-landfill-odours-list/Bluegums_Odour_Modelling_Assessment.pdf	9
	16.7
	0.35
	2.6
	0.7
	1.97
	0.2
	0.36
	0.08
	2.25
	0.99
	3.33

Library Source	Odour Emission Rate (OU/m²/s)
MWH (2015). Levin Landfill Odour Assessment. Available from: https://www.horizons.govt.nz/HRC/media/Media/Consent/Levin-Landfill-Odour-Assessment_Report-FINAL.pdf	1.50
	0.15
	1.56
Nicolas, J. et al. (2006). *Estimation of odor emission rate from landfill areas using the sniffing team method*. Published in: Waste Management (2006), vol. 26, iss. 11, pp. 1259-1269	8
	30
David White (2009). Peer Review Richmond Landfill, Napanee-Additional Comments. Available from: https://www.wm.com/content/dam/wm/assets/facilities/brec-currentops/documents/ministry/WMCC_Air_Model_Napanee_LF_Final_Rpt_RWDI_Peer_Rev_XCG_AERMOD.pdf	0.83
Szalata L. et al. (2021). *Assessment of the Odour Quality of the Air Surrounding a Landfill Site: A Case Study*. Sustainability 2021, 13(4).	5.1
Sarker, U. and Hobbs, S. (2003). *Landfill odour: assessment of emissions by the flux footprint method*. Environmental Modelling & Software Volume 18, Issue 2, March 2003, Pages 155-163.	25.91
	29.35
Odotech, 2001. *Caractérisation des émissions atmosphériques et évaluation de l'impact-odeur du lieu d'enfouissement sanitaire de la régie intermunicipale Argenteuil Deux Montagnes (Atmospheric emissions characterization and odor impact assessment of Argenteuil Deux Montagnes landfill area).* Montréal, Canada, Odotech Inc.	2.6
	5.4
Frechen, F.B., 1995. *A new model for estimation of odour emissions from landfill and composting facilities*. Sardinia 95, Cagliari, Italy.	1.11
	8.33

Table 4.4.8: Library Emission Rates for Landfill Cells with Intermittent Daily Cover

Library Source	Odour Emission Rate (OU/m²/s)
Sarkar, U. (1999). *Odour Nuisance from Solid Wastes: Development of a Model describing Emission, Dispersion and Reception*. Cranford University.	0.5
	1.5
Bletchley Landfill: Michael Bull & Associates (2025). *Odour emissions database (August 2025).* Available from: https://www.odourconsultant.co.uk/odour-emissions-database/	0.78
	0.96
MWH (2015). Levin Landfill Odour Assessment. Available from: https://www.horizons.govt.nz/HRC/media/Media/Consent/Levin-Landfill-Odour-Assessment_Report-FINAL.pdf	0.50
	1.79
Tonkin & Taylor (2020). *Bluegums Landfill Odour Modelling Assessment*. Available from: https://www.marlborough.govt.nz/repository/libraries/id:2ifzri1o01cxbymxkvwz/hierarchy/documents/services/recycling-and-waste/bluegums-landfill/bluegums-landfill-odours-list/Bluegums_Odour_Modelling_Assessment.pdf	0.16
	0.51
	0.016
	0.08
	0.10
	0.04
Frechen, F.B., 1995. *A new model for estimation of odour emissions from landfill and composting facilities*. Sardinia 95, Cagliari, Italy.	0.56
	1.67

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