South Oxfordshire and Vale of White Horse
Joint Local Plan 2041

Habitats Regulations Assessment
Air Quality Modelling Non-Technical Briefing Note

Joint Local Plan

South Oxfordshire District Council
Listening Learning Leading

Vale of White Horse District Council

March 2025

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Habitats Regulations Assessment Air Quality Modelling

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This non-technical briefing note has been produced to supplement the *"Assessing atmospheric pollution impacts as part of the Habitats Regulations Assessment of the Joint Local Plan for South Oxfordshire and Vale of White Horse: Proposed Methodology"* document issued to Natural England on 13 March 2025. Its content supersedes paragraphs 4.6-4.8 of the methodology paper and provides detail for the in-combination assessment as identified in paragraph 3.29. This note provides high-level clarification of the available traffic modelling data and of the air quality calculations to be made to inform further screening and appropriate assessment of the JLP following a meeting with Natural England and Oxon authorities on Wednesday 26 February 2025.

Appendix I sets out the technical details of the air quality modelling as discussed with Natural England on the 26 February 2025.

Note: all references to the '**Emerging Joint Local Plan (JLP)**' in the text below refer to an assessment which includes *all allocations from the South and Vale adopted Local Plans as modified by the JLP*. In other words, all the adopted allocations apart from the Chalgrove Airfield site, plus enlargement of the Dalton Barracks Garden Village site.

Traffic Data Availability

The Oxfordshire Strategic Model (OSM) modelled the following scenarios:

- **Traffic 1:** 2018 base year
- **Traffic 2**: 2041 with all the South & Vale adopted plan allocations built out, as well as adopted plan growth in other Oxfordshire districts and TEMPro outside Oxfordshire
- **Traffic 3:** 2041 with all the South & Vale emerging JLP allocations built out, as well as adopted plan growth in other Oxfordshire districts and TEMPro outside Oxfordshire

There are two key points about this traffic data which are important in understanding the framing of the air quality modelling calculations:

1. The modelled scenarios mean that it is not possible to separate out traffic associated with those site allocations built out to date from traffic associated with those which still remain to be constructed.

2. They also mean that traffic associated with South & Vale adopted plan growth cannot be separated out from traffic associated with adopted plan growth in other Oxfordshire districts (Cherwell, Oxford City and West Oxfordshire), they are all included.

Of the Oxfordshire authorities, South & Vale and Cherwell are the only ones whose plans have currently reached Regulation 19, so we have agreed with Natural England that just these three authorities' local plans can form part of the in-combination assessment. An additional traffic dataset will therefore be generated:

- **Traffic 4:** 2041 with all the South & Vale emerging JLP allocations built out, as well as adopted plan growth in other Oxfordshire districts and TEMPro outside Oxfordshire **and** Cherwell emerging plan growth.

Air Quality Modelling Calculations

The air quality modelling will separately run each of these traffic datasets (Traffic 1 to Traffic 4). The 2018 traffic data (Traffic 1) will be used alongside the 2021 APIS data to predict air quality in 2021. In addition, the 2018 traffic data (Traffic 1) will be used with future-year emissions to predict a 'future zero growth' scenario.

The air quality predictions for each traffic dataset will then be compared with each other to inform an assessment of air pollution effects of the **JLP alone** and **In- combination**.

JLP alone

The following calculations will be used to inform an assessment of the effects of the JLP alone:

- **JLP 1**: Traffic 3 minus Traffic 2 - to show the change in traffic flows in 2041 caused by replacing South and Vale adopted LPs with the JLP.

- **JLP 2**: Traffic 3 minus Traffic 1 (future zero growth) - to show the change in traffic flows caused by the emerging JLP plus the adopted plans of the other Oxfordshire districts and TEMPro. In other words, to show the impact at 2041 of implementing the emerging JLP when compared to a future with zero growth.

It should be noted that the '**JLP 2'** calculation will over-represent the impact of the South & Vale emerging JLP for two reasons associated with traffic data availability:

- Some of the site allocations in the South & Vale adopted plan (and neighbouring plans) will have already been built out since 2018; and

- It includes adopted plan growth from Cherwell, West Oxfordshire and Oxford City, as well as TEMPro growth for outside of Oxfordshire.

JLP In-Combination

The following calculations will be used to inform an assessment of the effects of the emerging JLP in-combination:

- **JLP In-Combination 1**: Traffic 4 minus Traffic 2 - to show the impact at 2041 of implementing the emerging JLP and the emerging Cherwell plan, when compared to South & Vale adopted plan allocations built out, plus adopted plan growth in other Oxfordshire districts and TEMPro outside Oxfordshire.

- **JLP In-Combination 2**: Traffic 4 minus Traffic 1 - to show the impact at 2041 of implementing the emerging JLP and emerging Cherwell plan, when compared to a future with zero growth.

These calculations were discussed with Natural England at the meeting on the 26 February 2025 and again at a virtual meeting on 26 March. They use the best available traffic data to inform an understanding of the effects of the emerging JLP alone and in-combination. They are sufficiently precautionary and ensure that the air quality modelling informs a worst-case assessment of adverse effects to integrity of the three SACs in question (Oxford Meadows, Aston Rowant and Cothill Fen).

Appendix 1: Air Quality Modelling Technical Details

Background Concentrations and Deposition

Background concentrations and deposition in 2021 will be taken from the Air Pollution Information System (APIS) for the three-year period 2020 to 2022.

Future changes to background NOx concentrations will be predicted using maps published by Defra. These predict background concentrations in each year from 2021 to 2040. For each grid square, the APIS background NOx concentration in 2021 will be adjusted by the relative change in Defra background NOx over the 2021 to 2040 period. This will be taken to represent background NOx in 2041.

Future changes to background ammonia and deposition fluxes will be predicted using the numerical values which underpin maps published as part of JNCC's Nitrogen Futures, using the Business as Usual (BAU) scenario. Nitrogen Futures predicted a change over the 13 year period from 2017 to 2030. The 2021 APIS data will be adjusted using 9/13 (i.e. 9 years rather than 13 years) of this total change. No further changes to background ammonia or deposition will be assumed between 2030 and 2041. The potential for increases to background ammonia over the period 2030 to 2041 will be noted but not included in the modelling. Nitrogen Futures does not forecast acid deposition, so the 2021 APIS values will be factored in the same way as nitrogen deposition; experience has shown that this is worst-case when compared with explicitly forecasting changes to other sources of acid.

Effects of Local Road Traffic

Concentrations and deposition will be predicted over an area extending 200m from each affected road which passes through, or is adjacent to, a relevant designated site. Only those roads within 200 m of designated sites will be included in the air quality modelling. Predictions will be made of:

- Annual mean NOx concentrations
- Annual mean ammonia concentrations
- Annual mean nutrient nitrogen deposition
- Annual mean acid deposition

NOx emissions from road traffic will be predicted using Version 13 of Defra's Emissions Factors Toolkit (EFT). Ammonia emissions from road traffic will be predicted using Version 2A of AQC's CREAM model. Dispersion modelling will use the ADMS-Roads model, following guidance published by the Institute of Air Quality Management. Deposition will be calculated using annual mean velocities issued by the Air Quality Technical Advisory Group ('AQTAG06').

For NOx, the model outputs will be verified against existing local air quality monitoring data. There is very limited roadside ammonia monitoring in the UK and none in the study area. No local verification for ammonia will be carried out.

The EFT and CREAM will be run to predict NOx and ammonia emissions for 2021 (also 2018 if required for model verification and sensitivity testing) and 2041.

As with CREAM V2A, EFT V13 has been developed to predict emissions out as far as 2050. However, other tools provided for the Local Air Quality Management (LAQM) regime only extended to 2040. EFT V13 therefore contains the following caveat:

"Supporting LAQM tools (e.g. Background Mapping Data, NO2 Adjustment for NOx Sector Removal Tool, and the NOx to NO2 Calculator) currently only support assessment years 2021-2040 inclusive. Therefore, where EFT calculated emissions are to be used after 2040 to inform air quality assessments, the appropriate caveats around the limitations of the analysis must be included to accompany the assessment."

2040 and 2041 are sufficiently similar that these tools can be robustly used, set to 2040, to predict concentrations in 2041. This will be noted as a minor limitation within the technical report.

Other Local Emissions

Other than road transport, no other local emissions sources will be included in the modelling.

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