Wolverhampton Local Plan Publication Consultation Regulation 19

Habitats Regulations Assessment

November 2024

LEPUS CONSULTING
LANDSCAPE, ECOLOGY, PLANNING & URBAN SUSTAINABILITY

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Habitats Regulations Assessment of the Wolverhampton Local Plan

Regulation 19 Publication Consultation

Habitats Regulations Assessment

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Acronyms & Abbreviations

AA	Appropriate Assessment
AADT	Annual Average Daily Traffic
A-dep	Acid deposition
AIOSI	Adverse Impact on Site Integrity
ALS	Abstraction License Strategy
APIS	Air Pollution Information System
BCCS	Black Country Core Strategy
BCP	Black Country Plan
CAMS	Catchment Abstraction Strategy
CIEEM	Chartered Institute of Ecology and Environmental Management
CJEU	Court of Justice of the European Union
CRT	Canal and Rivers Trust
CWC	City of Wolverhampton Council
DfT	Department for Transport
DMRB	Design Manual for Roads and Bridges
DTA	David Tyldesley and Associates
EA	Environment Agency
EP	Environmental Permits
GCN	Great Crested Newt
GIS	Geographic Information System
HDV	Heavy Duty Vehicle
HRA	Habitats Regulations Assessment
IAQM	Institute of Air Quality Management
IRZ	Impact Risk Zone
IUCN	International Union for Conservation of Nature
JNCC	Joint Nature Conservation Committee
LEV	Low Emission Vehicle
LPA	Local Planning Authority
LSE	Likely Significant Effect
LTP	Local Transport Plan
MOU	Memorandum of Understanding
N-dep	Nitrogen deposition
NH_3	Ammonia
NOx	Nitrogen oxides
NPPF	National Planning Policy Framework

PEBR	Planning Evidence Base Review
ppSPA	Possible Potential Special Protection Area
PRoW	Public Right of Way
pSAC	Potential Special Area of Conservation
RAP	Recommended Assessment Point
RBMP	River Basin Management Plan
SAC	Special Area of Conservation
SAMMM	Strategic Access Management and Monitoring Measures
SIP	Site Improvement Plan
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
SSW	South Staffordshire Water
STW	Sewerage Treatment Work
SuDS	Sustainable Urban Drainage
SWMC	Surface Water Management Catchment
UK	United Kingdom
WCS	Water Cycle Study
WFD	Water Framework Directive
WLP	Wolverhampton Local Plan
WRMP	Water Resource Management Plan
WRZ	Water Resource Zone
ZOI	Zone of Influence

Executive Summary

Introduction

E1. Lepus Consulting has been appointed, on behalf of the City of Wolverhampton Council to undertake a Habitats Regulations Assessment (HRA) in compliance with the Habitats Regulations (as amended)[1] of the Publication Wolverhampton Local Plan (WLP) at Regulation 19.

E2. This report provides the outputs of the HRA process which has been undertaken alongside preparation of the WLP.

Screening Outcomes (HRA Stage 1)

E3. The WLP is not directly connected with or necessary to the management of any European site. Consideration was therefore given to potential links or causal connections between the effects of the WLP and European sites within the study area to identify Likely Significant Effects (LSEs). This exercise was undertaken through the collation of information for each European site and application of a 'source-pathway-receptor' model.

E4. Taking no account of mitigation measures, the screening stage concluded that that the WLP had the potential to have LSEs at the following European sites:

- Cannock Chase SAC – air quality and recreational pressure LSEs;
- Cannock Extension Canal SAC – air quality and water quality/quantity LSEs;
- Fens Pools SAC – air quality and water quality/quantity LSEs;
- Humber Estuary SAC – water quality/quantity LSE;
- Humber Estuary Ramsar – water quality/quantity LSE;
- Midland Meres & Mosses Phase 1 Ramsar – water quantity LSE;
- Midland Meres & Mosses Phase 2 Ramsar – water quantity LSE;
- Mottey Meadows SAC – water quantity LSE;
- Severn Estuary SAC – water quality/quantity LSE;
- Severn Estuary Ramsar – water quality/quantity LSE; and,

E5. This therefore triggered the requirement to undertake the next stage of the HRA process, the Appropriate Assessment.

Appropriate Assessment Outcomes (HRA Stage 2)

Air Quality Appropriate Assessment

E6. The HRA provided an assessment of the ecological impacts of air pollution on Cannock Chase SAC, Cannock Extension Canal SAC and Fens Pools SAC. The Appropriate Assessment evaluated air quality impacts upon qualifying features within 200m of road links where traffic modelling

[1] The Conservation of Habitats and Species Regulations 2017 SI No. 2017/1012, TSO (The Stationery Office), London. Available at: https://www.legislation.gov.uk/uksi/2017/1012/contents [Accessed: 14/12/22] as amended by The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. Available at: https://www.legislation.gov.uk/ukdsi/2019/9780111176573 [Accessed: 12/07/24].

indicated an exceedance of a 1,000 AADT screening threshold and air quality modelling indicated an exceedance of 1% of critical loads or critical levels for each European site. Wolverhampton, Dudley, Sandwell, East Staffordshire, South Staffordshire, Stafford, Litchfield, Cannock Chase and Walsall Councils have worked together to prepare a joint strategic air pollution evidence base to support their local plan production in their respective local authority areas. The air quality Appropriate Assessment assessed the results of air quality modelling undertaken as part of this joint commission. The air quality modelling was reviewed in the context of the nature and extent of qualifying features and in the context of the conservation objectives for each European site. The Appropriate Assessment concluded no adverse impacts on the site integrity of any European site due to a change in air quality from the WLP either alone or in-combination.

Water Quality and Water Quantity Appropriate Assessment

E7. The HRA provided an assessment of the effects of a change in water quality and quantity due to WLP development on the European sites identified in paragraph E.4. This assessment included a consideration of the impacts of water quality on functionally linked watercourses used by migratory species of fish which are part of the qualifying features of the Severn Estuary SAC and Ramsar and Humber Estuary SAC and Ramsar designations. The Appropriate Assessment drew on the high-level regulatory water quality and quantity protective frameworks and WLP requirements, condition assessments and outputs from consultation with Severn Trent Water. This information was analysed in the context of the conservation objectives for each European site. Based on these factors, the Appropriate Assessment concluded no adverse impacts on the site integrity at any European site or qualifying species using functionally linked watercourses due to a change in water quality or quantity as a result of the WLP either alone or in-combination.

Public Access and Disturbance Appropriate Assessment

E8. The HRA provided an assessment of the ecological impacts of increased recreational pressure and urbanisation effects due to WLP development on the Cannock Chase SAC. This assessment took into consideration mitigation requirements in the form of Strategic Access Management and Monitoring Measures (SAMMM). This data was evaluated in the context of the location of allocations in relation to the SAC and the recreational Zone of Influence (ZOI). Taking into consideration WLP policy wording which secures appropriate mitigation measures, the Appropriate Assessment concluded no adverse impact on site integrity from public access and disturbance impacts alone or in-combination at Cannock Chase SAC.

Next steps

E9. The purpose of this report is to inform the HRA of the Publication WLP using best available information. The City of Wolverhampton Council, as the Competent Authority, is responsible for preparing the Integrity Test, which can be undertaken in light of the conclusions set out in this report.

E10. This report will be submitted to Natural England, the statutory nature conservation body, for formal consultation. The City of Wolverhampton Council must 'have regard' to their representations under the provisions of Habitats Regulations prior to making a final decision as to whether they will 'adopt' the conclusions set out within this report as their own.

1 Introduction

1.1 Background

1.1.1 The City of Wolverhampton Council (CWC) is currently preparing a new Wolverhampton Local Plan (WLP). This will contain strategic planning policies and housing and employment development allocations intended to support growth in Wolverhampton over the plan period to 2042. The WLP contains a Vision for Wolverhampton which is underpinned by strategic objectives and priorities. Planning policies set out in the WLP will guide land use and development across the City and set standards for growth and transformation.

1.1.2 The WLP will cover CWC's administrative area, hereafter referred to as the 'Plan area' and is illustrated in **Figure 1.1**.

1.1.3 Once adopted, the WLP will form part of the statutory development plan for the city covering the period to 2042, replacing the whole of the Black Country Core Strategy (BCCS) and parts of the following adopted Plans[2]:

- Bilston Corridor Area Action Plan (AAP)[3]
- Parts of Stafford Road Corridor AAP[4]
- Wolverhampton City Centre AAP[5]
- Wolverhampton Unitary Development Plan (2006)[6]

1.1.4 In February to March 2024, CWC undertook an Issues and Preferred Options Consultation at Regulation 18, as part of the plan making process. The responses to the Regulation 18 consultation have informed the current version of the Publication WLP at Regulation 19.

[2] Wolverhampton City Council, Walsall Council, Sandwell Metropolitan Borough Council and Dudley Metropolitan Borough Council (2011) Black Country Core Strategy Adopted February 2011. Available at: https://www.wolverhampton.gov.uk/planning/planning-policies/black-country-core-strategy [Accessed 22/07/24].

[3] Wolverhampton City Council (2014) Bilston Corridor Area Action Plan including Bilston Neighbourhood Plan 2013 – 2026. Available at: https://www.wolverhampton.gov.uk/sites/default/files/2022-02/bilston_corridor_aap_adopted_version_0.pdf [Accessed 22/07/24].

[4] Wolverhampton City Council (2014) Stafford Road Corridor Area Action Plan 2013 – 2026. Available at: https://www.wolverhampton.gov.uk/sites/default/files/2022-02/stafford_road_corridor_aap_adopted_version_0.pdf [Accessed 22/07/24].

[5] Wolverhampton City Council (2016) Wolverhampton City Centre Area Action Plan 2015 - 2026. Available at: https://www.wolverhampton.gov.uk/sites/default/files/2022-02/wolverhampton_city_centre_area_action_plan_adopted_version_0.pdf [Accessed 22/07/24].

[6] Wolverhampton City Council (2006) Wolverhampton Unitary Development Plan. Available at: https://www.wolverhampton.gov.uk/sites/default/files/2019-03/udp_june_2006.pdf [Accessed 22/07/24].

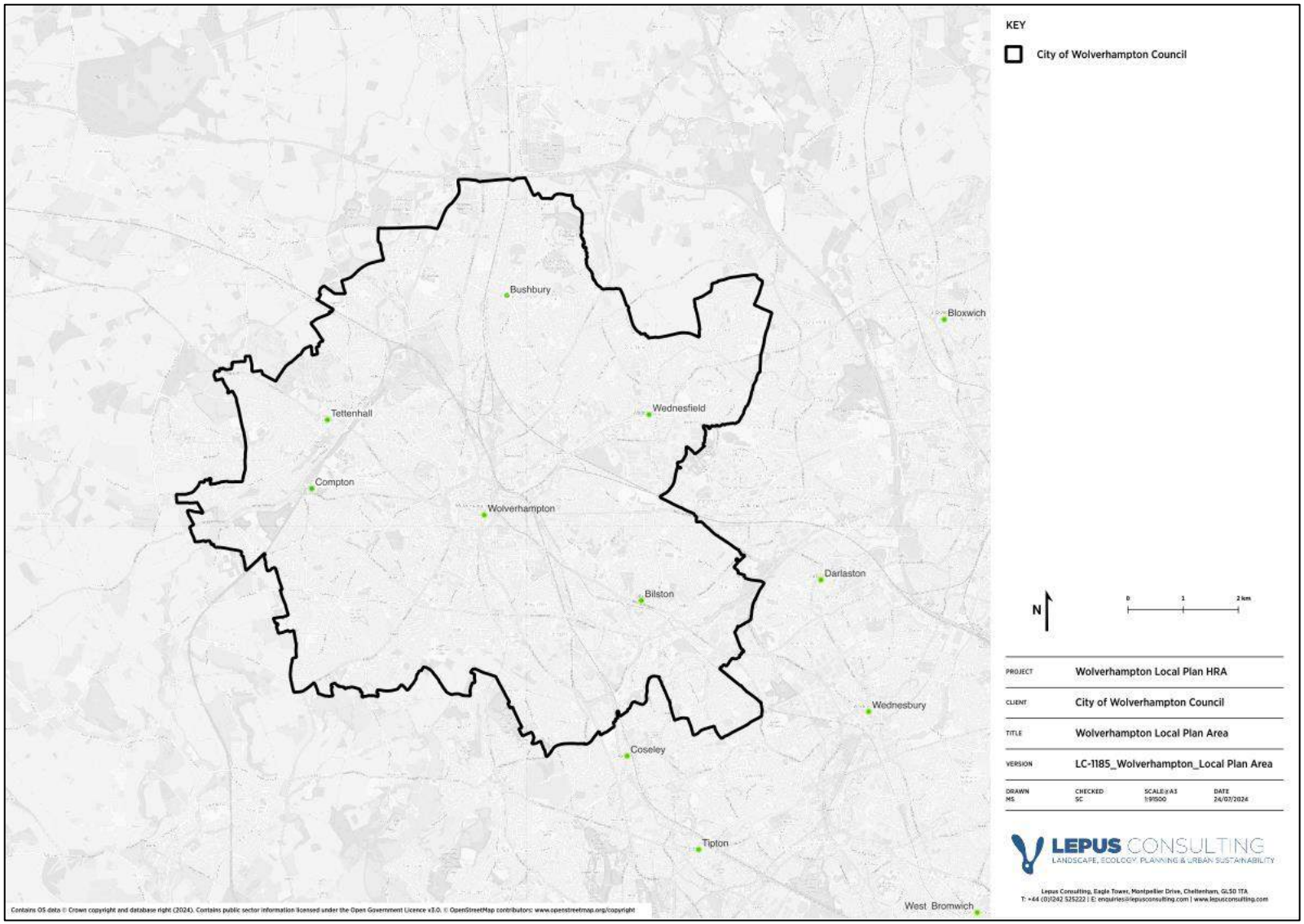

Figure 1.1: *Wolverhampton Local Plan area*

1.2 Habitats Regulations Assessment

1.2.1 The application of HRA to land-use plans is a requirement of the Conservation of Habitats and Species Regulations 2017 (as amended)[7]. HRA applies to plans and projects, including all Local Development Documents in England and Wales.

1.2.2 Where a plan is likely to have a significant effect on a European site (either alone or in-combination) and is not directly connected with or necessary to the management of the European site, Regulation 105 of the Habitats Regulations notes that the plan making authority for that plan must, before the plan is given effect, make an Appropriate Assessment (AA) of the implications for the site in view of that site's conservation objectives. These tests are referred to collectively as a Habitats Regulations Assessment (HRA).

1.2.3 The Habitats Regulations[8] provide a definition of a European site at Regulation 8. These sites include Special Areas of Conservation (SAC), Sites of Community Importance, Special Protection Areas (SPA) and sites proposed to the European Commission in accordance with Article 4(1) of the Habitats Directive. In addition, policy in England and Wales notes that the following sites should also be given the same level of protection as a European site[9]:

- A potential SPA (pSPA)
- A possible / proposed SAC (pSAC)
- Listed and proposed Ramsar Sites (wetland of international importance)
- In England, sites identified or required as compensation measures for adverse effects on statutory European sites, pSPA, pSAC, and listed or proposed Ramsar sites.

[7] The Conservation of Habitats and Species Regulations 2017 SI No. 2017/1012, TSO (The Stationery Office), London, as amended by The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019.

[8] Conservation of Habitats and Species Regulations 2017 SI No. 2017/1012, TSO (The Stationery Office), London, as amended by The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019.

[9] Department for Levelling up, Housing and Communities & Local Government (2023). National Planning Policy Framework. Para 187.

1.3 Previous HRA work

1.3.1 The Black Country Core Strategy[10] (BCCS, 2011) was produced and adopted by the four Black Country authorities of Dudley, Sandwell, Walsall and Wolverhampton. It covers the period up to 2026. The four authorities began a review of the BCCS in 2016, to roll forward the Plan and address changes that had taken place since 2011. This review was supported by a detailed evidence base including HRA work. In autumn 2022 the authorities decided not to take forward the Black Country Plan (BCP) review and instead pursue separate strategic plans and progress differing approaches to site allocations to meet identified needs. The evidence collated as part of the BCP review, draft BCP policies and responses to consultation on these remains relevant to the WLP. The Draft BCP consultation was accompanied by an HRA which included a preliminary screening and made recommendations to inform policy wording[11]. The HRA identified Likely Significant Effects (LSEs) associated with air quality, hydrology, public access and disturbance and habitat loss / fragmentation impact pathways at a number of European sites. The initial findings provide useful baseline information for this HRA.

1.3.2 In January 2024, CWC sought views on the direction of the draft WLP through an Issues and Preferred Options Consultation at Regulation 18. This Regulation 18 consultation was supported by an HRA which provided a screening of the vision and development strategy for the WLP, alongside site allocations and policies which were to be carried forward from the BCP[12]. The Regulation 18 WLP HRA identified possible impacts at the following European sites:

- Cannock Chase SAC – recreational pressure LSE;
- Cannock Extension Canal SAC – air quality and water quality/quantity LSEs;
- Ensor's Pool SAC – water quality/quantity LSE;
- Fens Pools SAC – air quality LSEs;
- Humber Estuary Ramsar – water quality/quantity LSE;
- Humber Estuary SAC – water quality/quantity LSE;
- Midland Meres and Mosses Phase 1 Ramsar – water quality/quantity LSE;
- Midland Meres and Mosses Phase 2 Ramsar – water quality/quantity LSE;
- Mottey Meadows SAC – water quality/quantity LSE;
- Pasturefields Salt Marsh SAC – water quality/quantity LSE;
- River Mease SAC – water quality/quantity LSEs;
- Severn Estuary Ramsar – water quality/quantity LSE; and,
- Severn Estuary SAC – water quantity/quality LSE;
- West Midland Mosses SAC – water quality/quantity LSE.

[10] Dudley Metropolitan Borough Council, Sandwell Metropolitan Borough Council, Walsall Council, Wolverhampton City Council (2011) Black Country Core Strategy. Available at: https://blackcountryplan.dudley.gov.uk/media/11559/core-strategy-12-final.pdf [Accessed 19/08/24].

[11] Lepus Consulting. July 2021. Habitats Regulations Assessment of the Black Country Plan. Interim HRA to support the plan making process. Available at: https://blackcountryplan.dudley.gov.uk/t2/p4/t2p4h/ [Accessed: 27/07/24].

[12] Lepus Consulting (January 2024) Habitats Regulations Assessment of the Wolverhampton Local Plan. Regulation 18 Issues and Preferred Options Consultation.

1.3.3 Natural England was consulted on the Issues and Preferred Options HRA and indicated the requirement to consider a wider study area as part of the air quality work. This has been addressed through a joint strategic air pollution evidence base commission, consideration of key commuting areas to / from the Plan area and strategically linked roads as detailed in **Section 3.4**. In addition, Natural England requested the consideration of likely significant effects upon water quality within the canal network, and in particular, the Cannock Extension Canal SAC. This has been addressed in **Section 3.5**[13].

1.4 Purpose of this report

1.4.1 Lepus Consulting has prepared this report to inform the HRA of the Regulation 19 Publication WLP on behalf of CWC. CWC, as the Competent Authority, will have responsibility to make the Integrity Test. This can be undertaken in light of the conclusions set out in this report, having regard to representations made by Natural England under the provisions of the Habitats Regulations.

1.4.2 This HRA report has been prepared in accordance with the Habitats Regulations and has been informed by the following guidance:

- Planning Practice Guidance: Appropriate Assessment[14]; and
- The Habitat Regulations Assessment Handbook - David Tyldesley and Associates (referred to hereafter as the DTA Handbook), 2013 (in particular Part F: 'Practical Guidance for the Assessment of Plans under the Regulations')[15].

[13] Natural England (2024) Wolverhampton Local Plan – Issues & Preferred Options (Regulation 18) Public Consultation Letter. 10 April 2024.

[14] Department for Levelling Up, Housing and Communities (July 2019) Planning Practice Guidance Note, Appropriate Assessment, Guidance on the use of Habitats Regulations Assessment.

[15] Tyldesley, D., and Chapman, C. (2013) The Habitats Regulations Assessment Handbook (June) (2024) edition UK: DTA Publications Limited.

2 Methodology

2.1 Overview

2.1.1 HRA is a rigorous precautionary process centred around the conservation objectives of a European site's qualifying interests. It is intended to ensure that European sites are protected from impacts that could adversely affect their integrity. A step-by-step guide to the methodology followed for the HRA is illustrated in **Figure 2.1**. This HRA report provides outputs from Stage 1 and Stage 2 of the HRA process.

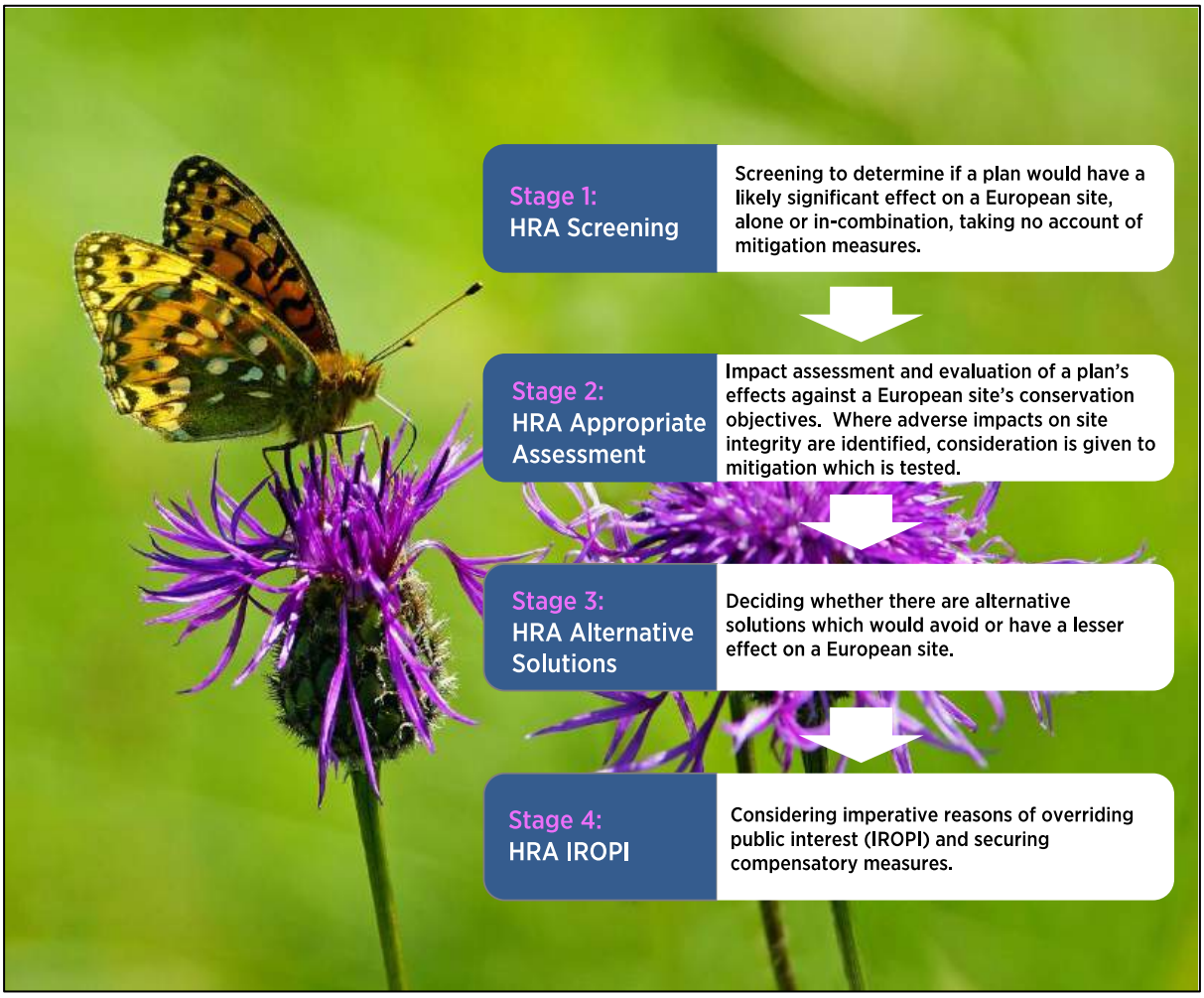

Figure 2.1: *Stages in the Habitats Regulations Assessment process*[16]

[16] Tyldesley, D., and Chapman, C. (2013) The Habitats Regulations Assessment Handbook (January) (2021) edition UK: DTA Publications Limited.

2.2 Stage 1: Screening for Likely Significant Effects

2.2.1 The first stage in the HRA process comprises the screening stage (see **Figure 2.1**). The purpose of the screening process is to firstly determine whether a plan is either (1) exempt (because it is directly connected with or necessary to the management of a European site), (2) whether it can be excluded (because it is not a plan), or (3) eliminated (because there would be no conceivable effects), from the HRA process. If none of these conditions apply, it is next necessary to identify whether there are any aspects of the plan which may lead to an LSE at a European site, either alone or in-combination with other plans or projects.

2.2.2 Screening was undertaken of the Issues and Preferred Options Consultation WLP which concluded that it had the potential to have LSEs on a number of European sites alone and in-combination. It therefore concluded that the WLP would be screened into the HRA process and an AA would be required (Stage 2 **- Figure 2.1**).

2.2.3 Where elements of the WLP have been updated in response to the Regulation 18 consultation and the updated supporting evidence base, these components have been re-screened to determine whether the Publication WLP is likely to have an LSE alone or in-combination. The codes set out in **Table 2.1** are used to inform the formal screening decision (Column 2). The results of this re-screening exercise are presented in **Chapter 4** of this report.

Table 2.1: Screening evaluation and reasoning categories from Part F of the DTA Handbook[17]

Screening evaluation and reasoning categories from Chapter F of the Habitats Regulations Assessment Handbook (DTA Publications, 2013):		Screen in / screen out
A.	General statements of policy / general aspirations	Screen Out
B.	Policies listing general criteria for testing the acceptability / sustainability of proposals.	Screen Out
C.	Proposal referred to but not proposed by the Plan.	Screen Out
D.	General plan-wide environmental protection / designated site safeguarding / threshold policies.	Screen Out
E.	Policies or proposals that steer change in such a way as to protect European sites from adverse effects.	Screen Out
F.	Policies or proposals that cannot lead to development or other change.	Screen Out
G.	Policies or proposals that could not have any conceivable or adverse effect on a site.	Screen Out
H.	Policies or proposals the (actual or theoretical) effects of which cannot undermine the conservation objectives (either alone or in-combination with other aspects of this or other plans or projects).	Screen Out
I.	Policies or proposals with a Likely Significant Effect on a site alone.	Screen Out
J.	Policies or proposals unlikely to have a significant effect alone.	Screen In

17 Tyldesley, D., and Chapman, C. (2013) The Habitats Regulations Assessment Handbook (December) (2019) edition UK: DTA Publications Limited. Available at: http://www.dtapublications.co.uk/ [Accessed: 10/01/24].

Screening evaluation and reasoning categories from Chapter F of the Habitats Regulations Assessment Handbook (DTA Publications, 2013):	Screen in / screen out
K. Policies or proposals unlikely to have a significant effect either alone or in-combination.	Screen Out
L. Policies or proposals which might be likely to have a significant effect in-combination.	Screen In
M. Bespoke area, site or case-specific policies or proposals intended to avoid or reduce harmful effects on a European site.	Screen In

2.2.4 The judgement by the European Court of Justice on the interpretation of the Habitats Directive in the case of People Over Wind and Sweetman vs Coillte Teoranta (Case C-323/17[18]) determined that mitigation measures are only permitted to be considered as part of the AA stage of the HRA process. The HRA screening process has therefore taken no account of incorporated mitigation or avoidance measures that are intended to avoid or reduce harmful effects on a European site when assessing the LSEs of the WLP on European sites. These are measures which, if removed (i.e. should they no longer be required for the benefit of a European site), would still allow the lawful and practical implementation of a plan.

2.3 In-combination effects

2.3.1 Should screening conclude there are no LSEs from the WLP alone, it is necessary to then consider whether the effects of the WLP in-combination with other plans and projects would combine to result in an LSE on any European site. It may be that the WLP alone will not have an LSE but could have a residual effect which may contribute to in-combination LSEs on a European site. The in-combination assessment is compliant with the Wealden Judgement (2017)[19].

2.3.2 Plans and projects which are considered to be of most relevance to the in-combination assessment of the WLP include those that have similar impact pathways (see **Appendix A**). These include those plans and projects which have the potential to increase development in the HRA study area including the following Local Planning Authority (LPA) local development plans:

- Birmingham City Council[20]
- Bromsgrove District Council[21]

[18] InfoCuria (2018) Case C-323/17. Available at: http://curia.europa.eu/juris/document/document.jsf?docid=200970&doclang=EN [Date accessed: 10/01/24].

[19] Wealden District Council & Lewes District Council before Mr Justice Jay. Available at: http://www.bailii.org/ew/cases/EWHC/Admin/2017/351.html [Date Accessed: 17/06/24].

[20] Birmingham City Council. (2017) Adopted Birmingham Development Plan. Available at: https://www.birmingham.gov.uk/downloads/file/5433/adopted_birmingham_development_plan_2031 [Accessed: 07/06/24]

[21] Bromsgrove District Council (2017) Bromsgrove District Plan 2011-2030. Available at: https://www.bromsgrove.gov.uk/media/samhiyxl/bromsgrove-district-plan-2011-2030.pdf [Accessed: 07/06/24]

- Cannock Chase District Council[22]
- Dudley Metropolitan Borough Council[23]
- Lichfield District Council[24]
- Sandwell Metropolitan Borough Council[25]
- Shropshire Council[26]
- South Staffordshire District Council[27]
- Stafford Borough Council[28]
- Telford and Wrekin Council[29]
- Walsall Council[30]
- Wyre Forest District Council[31]

[22] Cannock Chase Council. Cannock Chase Local Plan. Available at: https://www.cannockchasedc.gov.uk/residents/planning-and-building-control/planning-policy/cannock-chase-local-plan [Accessed 28/08/24].

[23] Dudley Metropolitan Borough Council. Dudley Local Plan. Available at: https://www.dudley.gov.uk/residents/planning/planning-policy/dudley-local-plan/ [Accessed 07/06/24].

[24] Lichfield District Council Local Plan. New Local Plan. Available at: https://www.lichfielddc.gov.uk/planning-policy/local-plan-review [Accessed 07/06/24].

[25] Sandwell Metropolitan Borough Council. Sandwell Local Plan. Available at: https://www.sandwell.gov.uk/planning/sandwell-local-plan [Accessed 14/06/24].

[26] Shropshire Council. Examination of the Draft Shropshire Local Plan (2016-2038). Available at: https://www.shropshire.gov.uk/planning-policy/local-planning/local-plan-review/draft-shropshire-local-plan-2016-2038-examination/ [Accessed 14/06/24].

[27] South Staffordshire District Council Local Plan Review. Available at: https://www.sstaffs.gov.uk/planning/planning-policy/local-plan-review [Accessed: 07/06/24].

[28] Stafford Borough Council. Stafford Borough Local Plan 2020-2040. Available at: https://www.staffordbc.gov.uk/local-plan [Accessed 28/08/24].

[29] Telford and Wrekin Council (2018) Local Plan 2011-2031 Adopted January 2018. Available at: https://apps.telford.gov.uk/downloads/localplan/Telford_and_Wrekin_Local_Plan_2011_2031_adopted_Jan_2018.pdf [Accessed 28/08/24].

[30] Walsall Council. Walsall Borough Local Plan. Available at: https://go.walsall.gov.uk/planning-and-building-control/planning-policy/future-planning-policy [Accessed 07/06/24].

[31] Wyre Forest District Council (2019) Wyre Forest District Local Plan 2016-36 Amendments to the Pre-Submission Publication Document. Available at: https://www.wyreforestdc.gov.uk/planning-and-buildings/planning-policy/wyre-forest-district-local-plan-2016-2036/ [Accessed 14/06/24].

2.3.3 In addition, other plans and projects with the potential to increase traffic across the study area have the potential to act in-combination with the WLP such as the West Midlands Local Transport Plan[32] and waste and mineral plans. Plans which allocate water resources or are likely to influence water quality in the study area have also been considered, including the Severn River Basin Management Plan (RBMP)[33], Humber RBMP[34] and Severn Trent Water Resources Management Plan (WRMP)[35] (**Appendix A**).

2.4 Stage 2: Appropriate Assessment and Integrity Test

2.4.1 Stage 2 of the HRA process comprises the AA and Integrity Test. The purpose of the AA is to undertake an assessment of the implications of a plan for a European site in light of its conservation objectives[36].

2.4.2 As part of this process, plan makers should take account of the potential consequences of no action, the uncertainties inherent in scientific evaluation and they should consult interested parties on the possible ways of managing the risk, for instance, through the adoption of mitigation measures. Mitigation measures should aim to avoid, minimise or reduce significant effects on European sites. Mitigation measures may take the form of policies within the WLP, or mitigation proposed through other plans or regulatory mechanisms. All mitigation measures must be deliverable and able to mitigate the adverse effects for which they are targeted.

2.4.3 The AA aims to present information in respect of all aspects of the WLP and ways in which it could, either alone or in-combination with other plans and projects, impact a European site. The plan making body (as the Competent Authority) must then ascertain, based on the findings of the AA, whether the Publication Local Plan will adversely affect the integrity of a European site either alone or in-combination with other plans and projects. This is referred to as the Integrity Test.

[32] West Midlands Combined Authority. (2016) West Midlands Strategic Transport Plan. Available at https://www.tfwm.org.uk/who-we-are/our-strategy/local-transport-plan/ [Accessed 07/06/24].

[33] Environment Agency (2022) Severn River Basin Management Plan summary and cross border catchments. Available at : https://www.gov.uk/government/publications/severn-river-basin-management-plan-summary-and-cross-border-catchments-england-and-wales/severn-river-basin-management-plan-summary-and-cross-border-catchments-england-and-wales [Accessed 07/06/24].

[34] Environment Agency (2022) Humber river basin district management plan: updated 2022. Available at: https://www.gov.uk/guidance/humber-river-basin-district-river-management-plan-updated-2022 [Accessed 07/06/24].

[35] Severn Trent Water (2024) Draft Water Resources Management Plan: Main Narrative. Available at: https://www.severntrent.com/content/dam/dwrmp24-st/STdWRMP24-Main-Narrative.pdf [Accessed 07/06/24].

[36] Department of Levelling Up, Housing and Communities (July 2019) Planning Practice Guidance Note, Appropriate Assessment, Guidance on the use of Habitats Regulations Assessment.

2.5 Dealing with uncertainty

2.5.1 Uncertainty is an inherent characteristic of HRA, and decisions can be made using currently available and relevant information. This concept is reinforced on the 7th of September 2004 'Waddenzee' ruling[37]:

2.5.2 'However, the necessary certainty cannot be construed as meaning absolute certainty since that is almost impossible to attain. Instead, it is clear from the second sentence of Article 6(3) of the Habitats Directive that the competent authorities must take a decision having assessed all the relevant information which is set out in particular in the Appropriate Assessment. The conclusion of this assessment is, of necessity, subjective in nature. Therefore, the competent authorities can, from their point of view, be certain that there will be no adverse effects even though, from an objective point of view, there is no absolute certainty'.

2.6 The Precautionary Principle

2.6.1 The HRA process is characterised by the Precautionary Principle which is embedded in the Integrity Test. The Precautionary Principle aims to ensure a higher level of environmental protection through preventative decision-taking in the case of risk[38].

[37] EC Case C-127/02 Reference for a Preliminary Ruling 'Waddenzee' 7th September 2004 Advocate General's Opinion (para 107).

[38] EUR-Lex. The Precautionary Principle. Available at: https://eur-lex.europa.eu/EN/legal-content/summary/the-precautionary-principle.html [Accessed: 07/03/24].

3 Scoping of Threats and Pressures at European Sites

3.1 Introduction

3.1.1 An important initial stage of the screening process is gathering information on European sites which may be affected by the WLP. This is informally known as scoping and provides an understanding of potential impact pathways from the WLP and connections to European sites and their vulnerabilities. This information is then used to inform the screening assessment (**Chapter 4**). This chapter presents an update to baseline information for each European site and their associated threats and pressures in the context of potential impacts from the Publication WLP at Regulation 19.

3.2 Identification of a HRA study area

3.2.1 Each European site has its own intrinsic qualities, besides the habitats or species for which it has been designated, that enables the site to support its particular ecosystems. An important aspect of this is that the ecological integrity of each site can be vulnerable to change from natural and human induced activities in the surrounding environment (known as pressures and threats). For example, sites can be affected by land use plans in a number of different ways, including the direct land take of new development, the type of use the land will be put to (for example, an extractive or noise-emitting use), or the pollution / threat a development generates (air pollution, water pollution or increased recreational pressure), and the resources used (water abstraction).

3.2.2 An intrinsic quality of any European site is its functionality at the landscape ecology scale. This refers to how the site interacts with its immediate surroundings as well as the wider area. This is particularly the case where there is potential for development resulting from a plan to generate water or air-borne pollutants, use water resources or otherwise affect water levels. Adverse effects may also occur via impacts to mobile species occurring outside a designated site boundary, but which are qualifying features of the site. For example, there may be effects on protected birds, bats and fish which use land outside a designated site for foraging, feeding, roosting, breeding or other activities.

3.2.3 There is no guidance that defines the study area for inclusion in an HRA. Planning Practice Guidance for Appropriate Assessment (listed above) indicates that: 'The scope and content of an appropriate assessment will depend on the nature, location, duration and scale of the proposed plan or project and the interest features of the relevant site. 'Appropriate' is not a technical term. It indicates that an assessment needs to be proportionate and sufficient to support the task of the competent authority in determining whether the plan or project will adversely affect the integrity of the site'.

3.2.4 This scoping exercise will help to determine the HRA study area and therefore which European sites will be considered in the HRA process.

3.3 Scoping impact pathways

3.3.1 Threats and pressures to which European sites are vulnerable have been identified through reference to data held by the JNCC and Natural England and through reference to Ramsar Information Sheets and Site Improvement Plans (SIPs). This information provides current and predicted issues at each European site and is summarised in **Appendix B.**

3.3.2 Supplementary advice notices prepared by Natural England often provide more recent information on threats and pressures upon European sites than SIPs and have therefore also been reviewed. A number of threats and pressures are unlikely to be exacerbated by the WLP and have therefore not been considered.

3.3.3 Sites of Special Scientific Interest (SSSIs) are protected areas in the United Kingdom designated for conservation. SSSIs are the building blocks of site-based nature conservation in the UK. A SSSI will be designated based on the characteristics of its fauna, flora, geology and/or geomorphology. Whilst typically analogous in ecological function, the reasons for its designation can be entirely different to those for which the same area is designated as a SAC, SPA or Ramsar.

3.3.4 Natural England periodically assesses the conservation conditions of each SSSI unit, assigning it a status. The conservation status of each SSSI highlights any European site that is currently particularly vulnerable to threats/pressures. Conservation status is defined as follows:

- Favourable;
- Unfavourable – recovering;
- Unfavourable – no change; or,
- Unfavourable – declining.

3.3.5 SSSI units in either an 'Unfavourable – no change' or 'Unfavourable – declining' condition indicate that the European site may be particularly vulnerable to certain threats or pressures. It is important to remember that the SSSI may be in an unfavourable state due to the condition of features unrelated to its designation. However, it is considered that the conservation status of SSSI units that overlap with European sites offer a useful indicator of habitat / species health at a particular location.

3.3.6 Natural England defines zones around each SSSI which may be at risk from specific types of development, these are known as Impact Risk Zones (IRZ). These IRZs are 'a GIS tool developed by Natural England to make a rapid initial assessment of the potential risks to SSSIs posed by development proposals. They define zones around each SSSI which reflect the particular sensitivities of the features for which it is notified and indicate the types of development proposal which could potentially have adverse impacts. The IRZs also cover the interest features and sensitivities of European sites, which are underpinned by the SSSI designation and "Compensation Sites", which have been secured as compensation for impacts on Natura 2000/Ramsar sites'[39]. The location of IRZs has been taken into consideration in this assessment as they provide a useful guide as to the location of functionally linked land (defined in **paragraph 3.3.7**) and likely vulnerabilities to development proposed within the WLP.

3.3.7 Based on the previous HRA work undertaken at Regulation 18, the following potential impact pathways are considered to be within the scope of influence of the WLP. Land use planning also has the potential to result in impacts upon qualifying features when located outside a designation boundary, known as functionally linked land (FLL)[40]. This HRA therefore also considers effects upon FLL or mobile species within the following topic assessments.

- **Air pollution:** Land use planning has the potential to increase atmospheric emissions of pollutants to the air. These can result in adverse effects at European sites such as eutrophication (nitrogen), acidification (nitrogen and sulphur) and direct toxicity (ozone, ammonia and nitrogen oxides)[41].
- **Water resources and water levels:** Urban development can change run off rates from urbanised areas to European sites or watercourses which run through them. An increase in housing provision can also influence supply and demand for water within the region which may impact water levels.
- **Water quality:** Surface water run-off from urban areas has the potential to reduce the quality of water entering a catchment. Water quality may also be reduced through point source effluent discharges from new development at Sewerage Treatment Works (STW) and other controlled discharge sources. Changes in water quality also have the potential to affect FLL (land or watercourses outside a designated site boundary).
- **Recreational pressure:** New housing development has the potential to increase recreational pressure upon European sites which are accessible to the public.

[39] Natural England (2019) Natural England's Impact Risk Zones for Sites of Special Scientific Interest User Guidance. Available at: https://magic.defra.gov.uk/Metadata_for_magic/SSSI%20IRZ%20User%20Guidance%20MAGIC.pdf [Accessed: 14/06/24].

[40] "The term 'functional linkage' refers to the role or 'function' that land or sea beyond the boundary of a European site might fulfil in terms of ecologically supporting the populations for which the site was designated or classified. Such land is therefore 'linked' to the European site in question because it provides an important role in maintaining or restoring the population of qualifying species at favourable conservation status". Source: Natural England (2016) Commissioned Report. NECR207. Functional linkage: How areas that are functionally linked to European sites have been considered when they may be affected by plans and projects - a review of authoritative decisions.

[41] APIS (2016) Ecosystem Services and air pollution impacts.

- **Urbanisation effects:** Urban development has the potential to result in disturbing activities (such as noise, lighting, cat predation and visual disturbance). Disturbance effects may impact upon European sites themselves and also their qualifying features when outside a designated site boundary. It may also result in the fragmentation of connecting habitats and corridors which could hinder the movement of qualifying species when located outside a designated site boundary.

3.4 Air quality

3.4.1 Natural England has developed a standard methodology for the assessment of traffic related air quality impacts under the Habitats Regulations which is relevant to the HRA of land use plans[42]. This guidance sets a methodology and thresholds for screening of Likely Significant (air quality) Effects at the HRA screening stage (Stage 1 of the HRA process).

3.4.2 Natural England's guidance (in the form of a series of questions below) has been applied to determine potential air quality impact pathways to European sites:

- Does the WLP give rise to emissions which are likely to reach a European site?
- Are the qualifying features of sites within 200m of a road sensitive to air pollution?
- Could the sensitive qualifying features of the site be exposed to emissions?
- Application of screening thresholds (alone and then, if necessary, in-combination).

Does the WLP give rise to emissions which are likely to reach a European site?

3.4.3 The WLP will trigger housing and employment development and consequently increase traffic related emissions. Air quality impacts have been shown to typically affect European sites within 10km of a plan boundary[43]. Campman and Kite (2021) note that 'this zone is based on professional judgment recognising that the effects of growth from development beyond 10km will have been accounted for in the Nitrogen Futures modelling work business as usual scenario'[44]. This 10km distance threshold can be a useful guide to identify the broad areas that may be impacted by air quality. However, it is noted that consideration should also be given to larger residential or commercial allocations and their wider potential for air quality impacts in the context of the local and regional road network.

[42] Natural England (2018) Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations (NEA001). Available at: http://publications.naturalengland.org.uk/publication/4720542048845824 [Accessed: 07/06/24].

[43] Chapman, C and Kite, B. (2021) Main Report. Guidance on Decision-making Thresholds for Air Pollution. JNCC Report No. 696. Available at: https://hub.jncc.gov.uk/assets/6cce4f2e-e481-4ec2-b369-2b4026c88447 [Accessed 11/06/24].

[44] JNCC. Nitrogen Future. Available at: https://jncc.gov.uk/our-work/nitrogen-futures/ [Accessed 11/06/24].

3.4.4 Data has therefore also been obtained from the Office for National Statistics. This data highlights the most common destinations for journeys to work undertaken by car or van arising from and finishing in the Plan area[45]. The key traffic destinations / origins include neighbouring authority areas such as South Staffordshire, Dudley, Walsall, Sandwell, Shropshire, Birmingham, Telford and Wrekin and Cannock Chase.

3.4.5 Wolverhampton, Dudley, Sandwell, East Staffordshire, South Staffordshire, Stafford, Litchfield, Cannock Chase and Walsall Councils are working together to prepare a joint strategic air pollution evidence base to support Local Plan production in their respective local authority areas. The following European sites were identified for consideration in this piece of work, drawing on information as set out in **paragraphs 3.4.3** and **3.4.4** and the location of European sites within each LPA administrative area[46]:

- Bee's Nest and Green Clay Pits SAC
- Cannock Chase SAC
- Cannock Extension Canal SAC
- Fens Pools SAC
- Midlands Meres and Mosses Phase 1 Ramsar Site - Chartley Moss SSSI and Betley Mere SSSI components
- Midlands Meres and Mosses Phase 2 Ramsar Site – Aqualate Mere SSSI and Cop Mere SSSI components
- Mottey Meadows SAC
- Pasturefields Salt Marsh SAC
- Peak District Dales SAC
- West Midlands Mosses SAC – Chartley Moss SSSI component

3.4.6 Taking into consideration the outputs from this joint commission, European sites beyond 10km of the Plan area, but within the key commuting areas outlined in **paragraph 3.4.4,** are therefore also considered within this HRA where they are linked to the Plan area via key strategic road links, as identified in **Table 3.1**. Key strategic road links provide a clear route linking residential and employment areas to / from the Plan area**.**

[45] Office for National Statistics (2011) Location of usual residence and place of work by method of travel to work (2011 census data). Travel by car or van only. Available at: https://www.nomisweb.co.uk/census/2011/WU03UK/chart/1132462281 [Accessed: 17/06/24].

[46] Middlemarch (2023) Creation of an Air Pollution Evidence Base Brief to Support Local Plan HRA Staffordshire, Wolverhampton, Walsall, Sandwell and Dudley.

Are the qualifying features of sites within 200m of a road sensitive to air pollution?

3.4.7 It is widely accepted that air quality impacts are greatest within 200m of a road source, decreasing with distance[47,48,49]. Baseline mapping data has been used to determine the proximity of European sites, and their qualifying features, to roads (within 200m) which may result in an exceedance of Natural England's screening thresholds (in particular A and B roads and motorways) within a 10km buffer from the Plan area and within the key commuting area[50] (**paragraphs 3.4.3** and **3.4.4**).

3.4.8 The UK Air Pollution Information System (APIS) provides information on all European sites and the sensitivity of their qualifying features (habitats and / or species) to air pollution. This data has been interrogated, alongside a desk-based review of site-based data (**Appendix B**), to determine whether there may be impact pathways from the WLP to any European site through a change in atmospheric emissions (**Table 3.1**). Consideration has also been given to the location of each European site and connectivity of road links to the Plan area (as set out in **paragraph 3.4.6**).

3.4.9 There are no strategic road links (motorways or A or B roads) within 200m of the following European sites and therefore these sites were scoped out of the joint commission (**paragraph 3.4.5**)[51].

- Mottey Meadows SAC;
- Peak District Dales SAC;
- West Midland Meres and Mosses Phase 1 Ramsar – Betley Mere SSSI component; and
- West Midland Meres and Mosses Phase 2 Ramsar – Aqualate Mere SSSI component.

3.4.10 The area of the West Midland Mosses SAC and Midland Meres and Mosses Phase 1 Ramsar underpinned by Chartley Moss SSSI lies within 200m of the A518. Habitat within 200m of the A518 is comprised of broad-leaved deciduous woodland. This is not a qualifying feature of the SAC designation or reason for notification of the site as a Ramsar. This site was therefore also scoped out of the joint commission[52]

[47] The Highways Agency, Transport Scotland, Welsh Assembly Government, The Department for Regional Development Northern Ireland (2007) Design Manual for Roads and Bridges, Volume 11, Section 3, Part 1: Air Quality.

[48] Natural England (2016) The ecological effects of air pollution from road transport: an updated review. Natural England Commissioned Report NECR 199.

[49] Bignal, K., Ashmore, M. & Power, S. (2004) The ecological effects of diffuse air pollution from road transport. English Nature Research Report No. 580, Peterborough.

[50] As per Nitrogen Futures Modelling Work – see Paragraph 5.4.8.

[51] Middlemarch (2023) Creation of an Air Pollution Evidence Base Brief to Support Local Plan HRA Staffordshire, Wolverhampton, Walsall, Sandwell and Dudley.

[52] Middlemarch (2023) Creation of an Air Pollution Evidence Base Brief to Support Local Plan HRA Staffordshire, Wolverhampton, Walsall, Sandwell and Dudley.

3.4.11 The following European designated sites were scoped in for further consideration through traffic and air quality modelling as part of the joint commission work[53]. This scope of work was agreed with Natural England in April 2023[54]. Reasons for scoping in and out European sites are set out in **Table 3.1**.

- Cannock Chase SAC;
- Cannock Extension Canal SAC;
- Fens Pools SAC;
- Pasturefields Salt Marsh SAC; and
- Midland Meres and Mosses Phase 2 Ramsar site (Cop Mere SSSI and Oakhanger Moss SSSI components).

[53] Middlemarch Environmental Ltd (March 2023) *Creation of an Air Pollution Evidence Base Brief to Support Local Plan HRA* (Report no. RT-MME-159172-01,Rev B).

[54] Natural England (14 April 2023) Letter addressed to 'Combined Partnership Authorities', confirming agreement with rationale for screening out certain European sites from requiring detailed air quality impact assessment (Natural England reference: 427535).

Table 3.1: Atmospheric pollution impact pathways to European sites

European site considered within joint air quality commission	Is the European site sensitive to air quality impacts? (see Appendix B)	Is there a key strategic road link (A and B roads linking to the Plan area) located within 200m of the European site and are qualifying features present.	Will the European site be scoped in for further assessment in the HRA process[55]?
Bee's Nest and Green Clay Pits SAC	Yes	No	No
Cannock Chase SAC	Yes	Yes (A460 (Rugeley Road), A513 and Camp Road (unclassified)) These road links are located over 13km to the north of the Plan area. The A460 is a primary road link, connecting Wolverhampton and Cannock with the M54, M6 and M6 Toll. The A513 provides a strategic route between Stafford and Rugeley, linking to the A51 to Tamworth. It is located approximately 16km from the Plan area and is not strategically linked to Wolverhampton. However, given the strategic nature of the A460, it will be scoped in for further assessment in the HRA process in terms of air quality impacts.	Yes
Cannock Extension Canal SAC	Yes	Yes (A5, Watling Street and B4154, Lime Lane) These road links are located approx. 6.4km to the east of the Plan area. The A5 is a primary road linking Tamworth and Telford. The A5 is not directly connected to the Plan area but is linked to Wolverhampton via the strategic road network. Given the proximity of the SAC to the Plan area, it will be scoped in for further assessment in the HRA process in terms of air quality impacts.	Yes
Fens Pool SAC	Yes	Yes (A4101, High Street and A461, Stourbridge Road) These road links are located approx. 4.8km south of the Plan area and are linked via the strategic road network. Given the proximity of the SAC to the Plan area and strategic road links, it will be scoped in for further assessment in the HRA process in terms of air quality impacts.	Yes

[55] Reasons for scoping out European site are provided in Sweco (2024) Traffic modelling to inform an assessment of air quality impacts of European sites in Staffordshire, Wolverhampton, Walsall, Sandwell and Dudley. Traffic Model Validation and Forecast.

European site considered within joint air quality commission	Is the European site sensitive to air quality impacts? (see Appendix B)	Is there a key strategic road link (A and B roads linking to the Plan area) located within 200m of the European site and are qualifying features present.	Will the European site be scoped in for further assessment in the HRA process[55]?
Midland Meres and Mosses Phase 1 Ramsar Component underpinned by: • Chartley Moss SSSI	Yes	Yes (A518) The A518 is located approx. 25km to the north of the Plan area. The only area of habitat within this component of the Ramsar which lies within 200m of the A518 is an area of broad-leaved deciduous woodland in Unit 5 of the underlying Chartley Moss SSSI. This is not a criterion of the Ramsar designation. No further assessment is therefore required in the HRA process and this component of the Ramsar is scoped out.	No
Midland Meres and Mosses Phase 1 Ramsar Component underpinned by: • Betley Mere SSSI	Yes	No	No
Midland Meres and Mosses Phase 1 Ramsar Component underpinned by: • Wybunbury Moss SSSI	Yes	Yes (B5071 (Stock Lane)) The joint commission scope indicates that no part of the SSSI lies within a partnership authorities' boundary, or within 10km of any jurisdictive boundary[56]. In addition, Stock Lane links the village of Wynbunbury to the village of Shavington and is not strategically connected to the Plan area. This component of the Ramsar will therefore not be considered further in the HRA process in terms of air quality effects and is scoped out.	No
Midland Meres and Mosses Phase 2 Ramsar Component underpinned by: • Aqualate Mere SSSI	Yes	No	No

[56] Middlemarch Environmental Ltd (March 2023) *Creation of an Air Pollution Evidence Base Brief to Support Local Plan HRA* (Report no. RT-MME-159172-01,Rev B).

European site considered within joint air quality commission	Is the European site sensitive to air quality impacts? (see Appendix B)	Is there a key strategic road link (A and B roads linking to the Plan area) located within 200m of the European site and are qualifying features present.	Will the European site be scoped in for further assessment in the HRA process[55]?
Midland Meres and Mosses Phase 2 Ramsar Component underpinned by: • Black Firs and Cranberry Bog SSSI	Yes	Yes (A513 (Newcastle Road) and B5500) The joint commission scope indicates that no part of the SSSI lies within a partnership authorities' boundary, or within 10km of any jurisdictive boundary[57]. Newcastle Rd (links several small villages and hamlets, Madeley Heath, Bowsey Wood, Wrinehil, Betley, New Thorntree, Hough, Shavington and Blakelow. It is considered highly unlikely that the future adoption of partnership local authorities' localplans (alone or in combination) could result in a measurable increase in annual traffic generation between these villages. The B5500 runs north of the site and only links the hamlet of New Thorntree to the hamlet of Balterley. As neither road link is strategically connected to the Plan area. This component of the Ramsar will therefore not be considered further in the HRA process in terms of air quality effects and is scoped out.	No
Midland Meres and Mosses Phase 2 Ramsar Component underpinned by • Oakhanger Moss SSSI	Yes	Yes (M6) The M6 at this point is located approx. 52km to the north-west of the Plan area. This site has been considered in the joint commission work and will therefore be included in the screening process to ensure a precautionary approach is taken.	Yes
Midland Meres and Mosses Phase 2 Ramsar Component underpinned by • Cop Mere SSSI	Yes	No This site has however been considered in the joint commission work and will therefore be included in the screening process to ensure a precautionary approach is taken.	Yes
Mottey Meadows SAC	Yes	No	No

[57] Middlemarch Environmental Ltd (March 2023) *Creation of an Air Pollution Evidence Base Brief to Support Local Plan HRA* (Report no. RT-MME-159172-01,Rev B).

European site considered within joint air quality commission	Is the European site sensitive to air quality impacts? (see Appendix B)	Is there a key strategic road link (A and B roads linking to the Plan area) located within 200m of the European site and are qualifying features present.	Will the European site be scoped in for further assessment in the HRA process[55]?
Pasturefields Salt Marsh SAC	Yes	Yes (A51) This road link is located more than 21km to the north-east of the Plan area. The A51 provides a cross-country route linking Chester and Litchfield and provides access to the M6, A38, M42, A55 and A5. It is not connected through strategic road links to the Plan area. This site has however been considered in the joint commission work and will therefore be included in the screening process to ensure a precautionary approach is taken.	Yes
Peak District Dales SAC	Yes	No	No
West Midlands Mosses SAC Component underpinned by: • Chartley Moss SSSI	Yes	Yes (A518) This road link is located approx. 25km to the north of the Plan area. The only area of habitat within this component of the Ramsar which lies within 200m of the A518 is an area of broad-leaved deciduous woodland in Unit 5 of the underlying Chartley Moss SSSI. This is not a criterion of the SAC designation. No further assessment is therefore required in the HRA process, and this SAC is scoped out.	No

Could the sensitive qualifying features of the site be exposed to emissions?

3.4.12 As noted above, the WLP will trigger housing and employment development and therefore has the potential to increase traffic related emissions along road links within 200m of a European site.

Application of screening thresholds (alone and then if necessary in-combination)

3.4.13 Natural England's advice on the assessment of air quality impacts under the Habitats Regulations states that consideration should be given to the risk of road traffic emissions associated with a Local Plan[58]. This advice states that an assessment of the risks from road traffic emissions can be expressed in terms of the average annual daily traffic flow (AADT) (as a proxy for emissions)). The use of the AADT screening threshold is advocated by Highways England in their Design Manual for Roads and Bridges (DMRB). This screening threshold is intended to be used as a guide to determine whether a more detailed assessment of the impact of emissions from road traffic is required. This non-statutory or guideline threshold is based on a predicted change of daily traffic flows of 1,000 AADT or more (or heavy-duty vehicle flows on motorways (HDV) change by 200 AADT or more).

3.4.14 The AADT thresholds do not themselves imply any intrinsic environmental effects and are used solely as a trigger for further investigation. Widely accepted environmental benchmarks for imperceptible impacts are set at 1% of the critical load or level, which is considered to be roughly equivalent to DMRB thresholds for changes in traffic flow of 1,000 AADT and for HDV of 200 AADT. This has been confirmed by modelling using the DMRB Screening Tool that used average traffic flow and speed figures from the Department for Transport (DfT) data to calculate whether the nitrogen oxides (NOx) outputs could result in a change of >1% of critical load / level on different road types. A change of >1,000 AADT on a road was found to equate to a change in traffic flow which might increase emissions by 1% of the Critical Load or Level and might consequentially result in an environmental effect nearby (e.g. within 10 metres of roadside).

3.4.15 The AADT thresholds and 1% of critical load/level are considered by Natural England to be suitably precautionary as any emissions below this level are widely considered to be imperceptible and, in the case of AADT, undetectable through the DMRB model. There can, therefore, be a high degree of confidence in its application to screen for risks of an effect.

3.4.16 Traffic modelling and forecasting for the joint commission air pollution evidence base was carried out using the PRISM 5.3 model, acquired from Transport from West Midlands. Forecast year traffic volumes were calculated for the following scenarios:

- Future Year 'Do nothing' assessment (2042): AADT forecast by assuming no growth inside the joint strategic partnership authorities and Tempro growth outside of the partnership authorities;
- Future Year with Local Plan 'In-combination' assessment (2042): AADT forecast by assuming local planning-based growth inside all joint strategic partnership authorities and Tempro growth outside of the joint strategic partnership authorities.

[58] Natural England (2018) Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations (NEA001). Available at: http://publications.naturalengland.org.uk/publication/4720542048845824 [Accessed: 12/06/24]

3.4.17 Further information on the traffic modelling methodology can be obtained in the traffic modelling report[59].

3.4.18 Traffic flows were calculated for a number of Recommended Assessment Points (RAPs) on road links which are located within 200m of the relevant scoped in European sites (see **Table 3.1**). RAPs of relevance to each scoped in European site are set out in **Table 3.2**.

Table 3.2: Recommended Assessment Points modelled in traffic modelling

European Site	RAP Ref	Road Type	Road Name
Cannock Chase SAC	RAP 1	A	A513
	RAP 2	A	A460 Rugeley Road
	RAP 3	Unclassified	Camp Road
Cannock Extension Canal SAC	RAP 10	A	A5 Watling Street
	RAP 11	B	B4154 Lime Lane
Fens Pool SAC	RAP 12	A	A4101 High Street
	RAP 13	A	A461 Stourbridge Road
Midland Meres and Mosses Phase 2 Ramsar – Cop Mere SSSI component	RAP 8	Unclassified	Unnamed
Midland Meres and Mosses Phase 2 Ramsar– Oakhanger Moss SSSI component	RAP 25	Motorway	M6
Pasturefields Salt Marsh SAC	RAP 4	A	A51

3.4.19 The in-combination assessment was completed by comparing the results of the 'baseline' scenario and the 'with partnership authorities local plans' scenario or in-combination scenario. It is noted that no future year alone plan scenario was provided for Wolverhampton in the traffic modelling.

3.4.20 This traffic modeling output data was screened against Natural England's 1,000 AADT threshold for LSEs (and 200 AADT for HDV). Where in-combination traffic flows exceeded the 1,000 AADT threshold (or 200 HDV), these road links were screened in for further consideration in the AA process. Traffic data and screening outputs are presented in Table 8 of the Air Quality Report which is provided at **Appendix C**[60].

[59] Sweco (2024) Traffic modelling to inform an assessment of air quality impacts of Europeans sites in Staffordshire, Wolverhampton, Walsall, Sandwell, and Dudley. Traffic Model Validation and Forecast

[60] Sweco (2024) Assessment of Air Quality Impacts on European Sites in Staffordshire, Wolverhampton, Walsall, Sandwell and Dudley.

3.4.21 The resulting increase in total daily highway traffic (AADT) at the RAP sites between the 'baseline' scenario and the 'with partnership authorities local plans' scenario (i.e. the in-combination scenario) varied depending on the road type. The outcomes from the traffic modelling confirm that each European site / land parcel was screened into the dispersion modelling assessment based on the in-combination traffic flow impact, with the exception of Cop Mere SSSI (component of the Midland Meres and Mosses Phase 2 Ramsar site) where the in-combination change in traffic is (+52 AADT) is well below the 1,000 domestic AADT criterion.

3.4.22 In addition, following consultation with Natural England on September 2024[61], it was agreed that Oakhanger Moss SSSI (component of the Midland Meres and Mosses Phase 2 Ramsar site) could be justifiably screened out of the air quality assessment, as the in-combination traffic changes is almost entirely attributed to national background growth at RAP 25 (M6 motorway). The contribution to the traffic change attributed to the Partnership Authorities Local Plans is forecast to be below 100 domestic AADT, which is notably below the 1,000 AADT screening threshold.

3.4.23 Given the identified exceedances at Cannock Chase SAC, Cannock Extension Canal SAC, Fens Pools SAC and Pasturefields Salt Marsh SAC, air quality modelling was therefore commissioned to better define air quality impacts. This modelling is reported upon in the Air Quality Assessment Report[62] (see **Appendix C**).

3.4.24 The air quality modelling focused on the following pollutants which are associated with traffic related emission sources:

- Nitrogen oxides (NOx)
- Ammonia (NH_3)
- Nutrient nitrogen deposition (N-dep)
- Acid deposition (A-dep)

[61] Partnership Authorities Steering Group Meeting, dated 25 September 2024, attended by Natural England's Principal Officer – Flexible Casework Team. Natural England agreed that Oakhanger Moss could be screened out of the HRA air quality assessment on the basis that the increase in traffic at RAP 25 (M6 motorway) between the 2042 Alternative Future Base and 2042 With Partnership Authorities Local Plans was predominantly attributed to national background traffic growth (>7,000 domestic AADT). By comparison, the in-combination contribution from of the Partnership Authorities Local Plans is forecast to be less than 100 (one hundred) domestic AADT at RAP 25 (M6) and will not result in an impact above the 1% significance screening criterion for any of the assessed pollutants at Oakhanger Moss.

[62] Sweco (2024) Assessment of Air Quality Impacts on European Sites in Staffordshire, Wolverhampton, Walsall, Sandwell and Dudley.

3.4.25 Nitrogen oxides (NOx) are produced during the combustion processes, partly from nitrogen compounds in the fuel, but mostly by direct combination of atmospheric oxygen and nitrogen in flames[63]. Road transport emissions of NOx in 2018 were the largest contributor to UK total emissions of NOx with most emissions related to diesel vehicles[64]. The introduction of catalytic converters has seen an overall reduction in emissions since 1990. NOx has the potential to impact habitats through direct toxicity and through their contribution to nitrogen deposition. The critical level for all vegetation types from the direct toxic effects of NOx has been set at 30 μg/m^3.

3.4.26 Ammonia originates from both natural and anthropogenic sources, with the main man-made source being agriculture. Other man-made sources of ammonia include industrial processes and vehicular emissions (from catalyst-equipped petrol vehicles and selective catalytic reduction on light and heavy goods diesel fueled vehicles). As with NOx, elevated levels of ammonia can be directly toxic to plants and can also enrich a system with nitrogen causing eutrophication and acidification effects on habitats.

3.4.27 Lichen species can be sensitive to even small increases in ammonia (1 μg/m^3)[65]. As such, there are two critical levels for ammonia, 1 μg m^{-3} for lower plants (lichens and bryophytes[66]) and 3 μg/m^3 for higher level plants (all other vegetation). The adopted critical levels of ammonia applied in the air quality assessment were based on the information provided by Middlemarch Environmental Ltd[67] which were determined through a review of relevant qualifying habitat(s) or habitats upon which qualifying species rely at each European site and agreed with Natural England[68]. The air quality modelling for Cannock Extension Canal SAC and Fens Pools SAC has applied the threshold of 3 μg/m^3. The air quality modelling for Cannock Chase SAC has applied the threshold of 1 μg/m^3.

3.4.28 APIS describes nitrogen deposition as 'the input of reactive nitrogen from the atmosphere to the biosphere both as gases, dry deposition and in precipitation as wet deposition[69]'. Anthropogenic sources of enhanced reactive nitrogen deposition come from emissions of oxidised nitrogen (NOx) and fossil fuel combustion and reduced nitrogen from agricultural sources.

[63] Air Pollution Information Systems (2017) Pollutants, available at: https://www.apis.ac.uk/ [Accessed: 07/08/24].

[64] National Atmospheric Emissions Inventory. Available at: https://naei.beis.gov.uk/overview/pollutants?pollutant_id=6 [Accessed: 07/08/24].

[65] Air Pollution Information Systems. Pollutants. Available at: https://www.apis.ac.uk/ [Accessed: 07/08/24].

[66] *Lichens and mosses are at most risk as they have limited detoxification capacity relative to their uptake potential and a large surface area relative to mass.* Source: Air Pollution Information Systems. Pollutants. Available at: http://www.apis.ac.uk/overview/pollutants/overview_NH3.htm [Date Accessed: 07/08/24].

[67] Middlemarch (2023) Creation of an Air Pollution Evidence Base Brief to Support Local Plan HRA Staffordshire, Wolverhampton, Walsall, Sandwell and Dudley.

[68] Natural England (14/04/2024) Planning consultation: Creation of an Air Pollution Evidence Base Brief to Support Local Plan HRA [Letter].

[69] APIS. Nitrogen Deposition. Available at: https://www.apis.ac.uk/ [Accessed: 07/08/24].

3.4.29 Nitrogen is a major growth nutrient for plants. An increase in nitrogen can be toxic to plants and can lead to eutrophication which can cause species loss and changes in the structure and function of ecosystems. Nitrogen can also cause acidification of soils, the effects of which are discussed in more detail below (see acidification in **paragraph 3.4.30**). Traffic related inputs of NOx and ammonia have an impact on the rates of nitrogen deposition. Nitrogen deposition rates are habitat specific as different habitats have different tolerances to different levels. Where a critical load range is provided, the lower end of the range has been used in this screening assessment to ensure a precautionary approach has been taken. The nitrogen deposition critical load for both Cannock Chase Extension Canal SAC and Fens Pools SAC is 10kgN/ha/yr.

3.4.30 Since early 2024, the nitrogen deposition critical load for Cannock Chase SAC, as specified on APIS, is 5-15kgN/ha/yr. However, all HRA evaluation in this report has been prepared using air quality modelling information which has utilised the 2023 critical load range: 10-20kgN/ha/yr since, which at the time of the joint commission air quality modelling was based on the best available information. The adopted critical loads for nitrogen applied in the air quality modelling were based on the information provided by Middlemarch Environmental Ltd[70] and agreed with Natural England in 2023[71].

3.4.31 Acidification comprises the deposition of pollutants to soils which changes the pH level causing acidification. The contribution of SO_2 to acid deposition has reduced since the 1980s, with controls on transboundary emissions, so that the main contribution to acidification is from sources of oxidised and reduced nitrogen. The effect of acid deposition is indirect and related to the lowering of soil pH leading to reduced fertility and nutrient deficiencies, the release of toxic metals and changes in microbial transformations[72]. As with nitrogen deposition, acid deposition rates are habitat specific. Neither Cannock Chase Extension Canal SAC nor Fens Pools SAC are sensitive to acidification and therefore this pathway of impact is scoped out of the assessment[73]. Cannock Chase SAC is however sensitive to acidification, and this will be addressed further with a critical load of 1.285 keq/ha/yr applied.

3.4.32 The air quality modelling provided more detailed locally based and spatial air quality data. This allowed a comparison of the change in emissions against 1% of the individual pollutant critical load or level (as set out in **paragraph 3.4.13**). This modelling data was used to provide an assessment of LSEs in the context of critical levels and loads, following Natural England's guidelines, against the 1% screening threshold.

[70] Middlemarch (2023) Creation of an Air Pollution Evidence Base Brief to Support Local Plan HRA Staffordshire, Wolverhampton, Walsall, Sandwell and Dudley.

[71] Natural England (14/04/2024) Planning consultation: Creation of an Air Pollution Evidence Base Brief to Support Local Plan HRA [Letter].

[72] The APIS. Acid Deposition. Available at: http://www.apis.ac.uk/overview/pollutants/acid-deposition [Accessed: 21/12/22]

[73] Middlemarch (2023) Creation of an Air Pollution Evidence Base Brief to Support Local Plan HRA Staffordshire, Wolverhampton, Walsall, Sandwell and Dudley.

3.4.33 **Appendix C** provides the outputs of the air quality modelling results against the 1% screening threshold. The air quality modelling was undertaken at receptor grids across each European site within 200m of a modelled road link. The air quality modelling also provides further assessment beyond 200m and up to 1,000m from the closest modelled road link within each European site. Where a road link was within 200m of a European site, receptors were modelled at 10m intervals up to a distance of 200m. Beyond 200m from a road link, receptors were modelled at 50m intervals up to 1,000m from the site boundary. The extent of receptors modelled is illustrated in **Appendix C**.

3.4.34 As set out in Section 5 of the Air Quality Report (**Appendix C**), the 1% NOx threshold in-combination at Cannock Extension Canal SAC was exceeded at a high proportion of receptors adjacent to the south of the A5 Watling Street (RAP 10) and north of B4154 Lime Lane (RAP 11). At Fens Pools SAC the 1% screening threshold for NOx in-combination was exceeded at a number of receptors within 50m of the A4101 High Street (RAP 12) within the northern area of the SAC. At Cannock Chase SAC the 1% screening threshold for NOx in-combination was exceeded at a number of receptors immediately adjacent to the A513 (RAP 1). These exceedances are illustrated in **Appendix C**. There were no exceedances of the 1% screening threshold for NOx in-combination at Pasturefields Salt Marsh SAC.

3.4.35 In terms of NH_3, approximately 40% of the Cannock Extension Canal SAC area was shown to exceed the 1% screening criterion in-combination, mainly encompassing the area of the SAC between the south of the A5 Watling Street (RAP 10) and north of B4154 Lime Lane (RAP 11). At Fens Pools SAC, the 1% screening criterion in-combination was exceeded for NH_3 within 50m to the south of the A4101 High Street (RAP 12). At the Cannock Chase SAC the screening threshold was exceeded within 50m either side of the A513 (RAP 1) and a narrow band within 30m of the A460 (RAP 2). These exceedances are illustrated in **Appendix C**. There were no exceedances of the 1% screening threshold for NH_3 in-combination at Pasturefields Salt Marsh SAC.

3.4.36 In terms of nitrogen deposition, at Cannock Chase SAC the 1% screening threshold was shown to be exceeded at a number of receptors within 40m either side of the A513 (RAP 1). In terms of nitrogen deposition, approximately 60% of the Cannock Extension Canal SAC was modelled to experience in-combination impacts above the 1% significance screening criterion. This area encompassed the entirety of the SAC between the south of the A5 Watling Street (RAP 10) and north of B4154 Lime Lane (RAP 11). Approximately 10% of Fens Pools SAC was modelled to experience in-combination impacts above the 1% significance screening criterion. This included the area within 70m to the south of the A4101 High Steet (RAP 12). Additional in-combination levels above the 1% criterion were modelled up to 20m within the SAC adjacent to the east of Tennyson Street. These exceedances are illustrated in **Appendix C**. There were no exceedances of the 1% screening threshold for nitrogen deposition in-combination at Pasturefields Salt Marsh SAC.

3.4.37 In terms of acidification, at Cannock Chase SAC, the 1% screening threshold was exceeded directly adjacent to the A513 (RAP1) where it passes through the northern area of the SAC.

3.4.38 Based on a review of air quality modelling data against Natural England's 1% significance screening threshold for each pollutant (see Appendix C), air quality pathways of impacts at Cannock Chase SAC, Cannock Extension Canal SAC and Fens Pools SAC have been screened in for further consideration in the HRA process in terms of NOx, ammonia and nitrogen deposition. Acid deposition has been screened in at Cannock Chase SAC only. Air quality impacts at Pasturefields Salt Marsh SAC are all below the 1% screening threshold and therefore likely significant air quality effects at this SAC can be screened out.

3.5 Water quality and water quantity

3.5.1 Development proposals associated with the WLP have the ability to affect water-dependent European sites through a number of impacts as listed below. These impacts have the potential to change the water balance (levels) and quality of water entering European sites:

- Change in surface permeability and run off rates
- Increased water demand to supply new homes and businesses
- Reduce quality of surface water run off
- Increased effluent discharge for treatment

3.5.2 There are no European sites located within the Plan area. European sites located outside the Plan area can also be affected by changes in water supply and quality where they are hydrologically linked to development in the WLP. In addition, land use planning has the potential to result in impacts upon qualifying features of European sites (for instance species of fish or birds) when they are located outside a designation boundary, known as FLL (a definition is provided in **paragraph 3.3.7**).

3.5.3 The tests set out under Article 105 of the Habitats Regulations need to be applied in respect of plans which may significantly affect FLL with an important role in contributing to the favourable conservation status of the relevant species for which a European site is designated.

3.5.4 The Plan area is located within the south-eastern most part of the Humber River Basin District and the north-west of the Severn River Basin District. Each river basin district is managed through division into Surface Water Management Catchment (SWMC). SWMCs outline the preferred surface water management strategy alongside establishing a long-term action plan for surface water. In the Severn River Basin District, the Plan area coincides with the Severn Middle Worcestershire SWMC. In the Humber River Basin District, the Plan area coincides with the Trent Valley Staffordshire SWMC and the Tame, Anker and Mease SWMC, as illustrated in **Figure 3.1.**

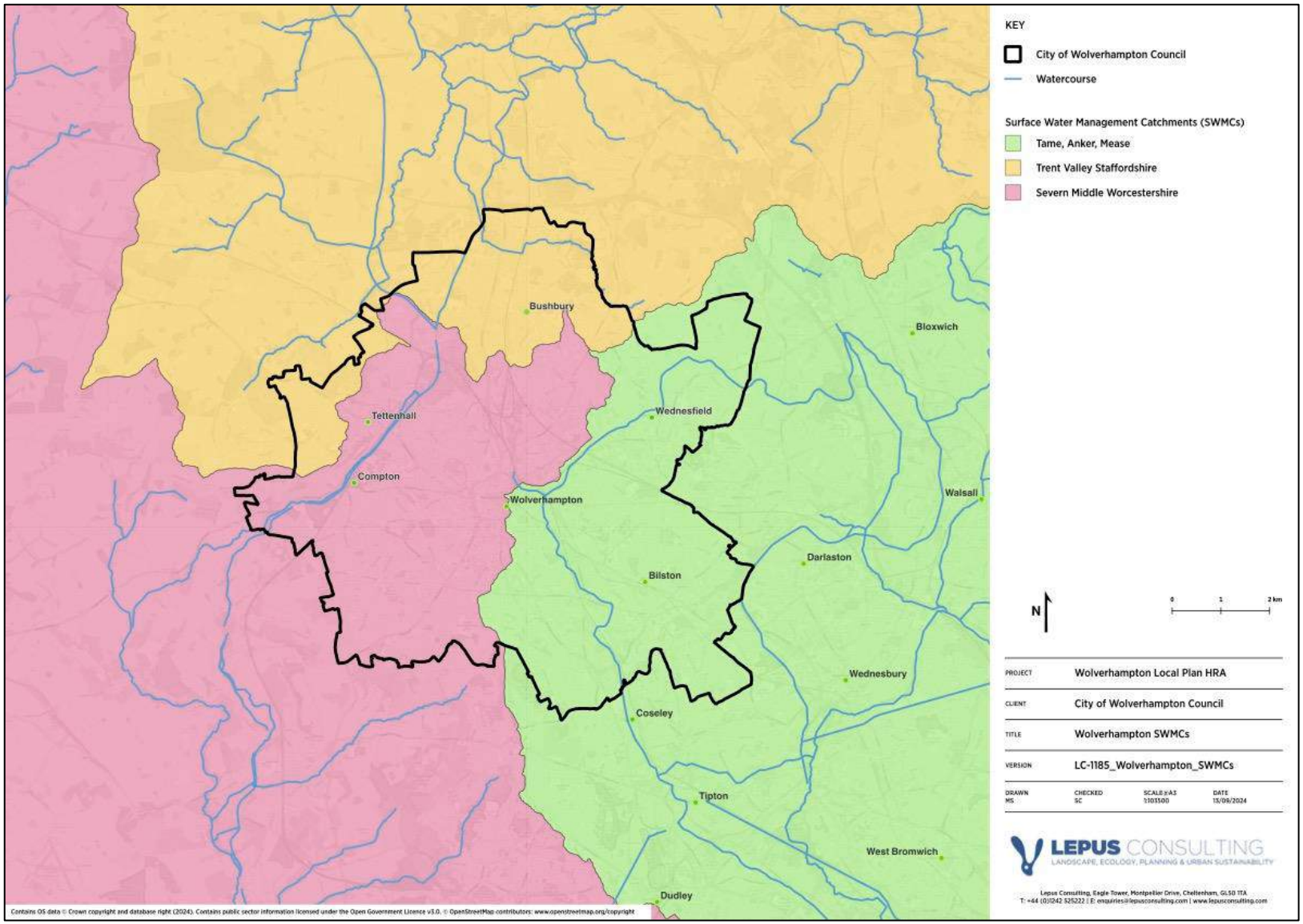

Figure 3.1: *Surface Water Management Catchments (SWMCs) within the Plan area*

3.5.5 The western section of the Plan area lies within the Severn Middle Worcestershire SWMC of the Severn River Basin District (**Figure 3.1**). Smestow Brook drains this section of the Plan area to the River Stour, which joins the River Severn at Stourport-on-Severn. The River Severn ultimately flows into the Severn Estuary, which is designated as a SAC, SPA and Ramsar for a number of qualifying features (**Appendix B**).

3.5.6 The eastern section of the Plan area lies within the Tame Anker and Mease SWMC and the northern section of the Plan area lies within the Trent Valley Staffordshire SWMC, both within the Humber River Basin District (**Figure 3.1**). The Waterhead Brook drains the northern section of the Plan area and is a tributary of the River Penk. The River Penk meets the River Sow at Baswich, which then flows into the River Trent near Essex Bridge. The River Trent flows into the Humber Estuary which is designated as a SAC, SPA and Ramsar for a number of qualifying features (**Appendix B**). There are no surface water features draining the eastern section of the Plan area.

3.5.7 An extensive canal network is located within and around the Plan area. The Birmingham Canal passes through the centre of Wolverhampton with the Wyrley and Essington Canal passing through the west of Wolverhampton. The Wyrley and Essington Canal is hydrologically linked to Cannock Extension Canal SAC. The Staffordshire and Worcestershire Canal runs in a north-east to south-west direction through the Plan area and is joined from the north-west by the Shropshire Union Canal.

3.5.8 Decisions relating to water abstraction for the supply and disposal of water are controlled through a number of licensing mechanisms and a high-level water planning framework which is subject to HRA. This ensures the protection of the water environment and compliance with the Water Framework Directive (WFD).

3.5.9 The Severn River Basin Management Plan (RBMP)[74] and the Humber RBMP[75] provide a framework for protecting and enhancing the benefits provided by the water environment (see **Appendix A**). To achieve this, and because water and land resources are closely linked, they also inform decisions on land-use planning. RBMPs provide strategic level policy guidance in relation to baseline classification of water bodies, statutory objectives for protected areas and water bodies, and a summary of measures to achieve statutory protection.

[74] Environment Agency (2022) Severn River Basin Management Plan. Available at: https://www.gov.uk/guidance/severn-river-basin-district-river-basin-management-plan-updated-2022 [Accessed: 30/05/24].

[75] Environment Agency (2022) Humber River Basin Management Plan. Available at: https://www.gov.uk/guidance/humber-river-basin-district-river-management-plan-updated-2022 [Accessed: 30/05/24].

3.5.10 Severn Trent Water is the statutory water supplier for Wolverhampton[76] It is a statutory requirement that every five years water companies produce and publish a Water Resources Management Plan (WRMP) (a summary is provided in **Appendix A**). The WRMP demonstrates long term plans to accommodate the impacts of population growth, drought, environmental obligations, and climate change uncertainty in order to balance supply and demand. WRMP's are linked to Drought Plans (a summary of the SSW and Severn Trent Water Drought Plans is provided in **Appendix A**) which detail the steps that would be taken to ensure supplies can be maintained whilst minimising the impacts to rivers and the environment during drought events.

3.5.11 The Severn Trent Water WRMP[77] estimates future water demands and plans how these levels will be achieved. The plan is currently under review and the draft Severn Trent Water WRMP 2024[78] has been published for consultation. The WRMPs outline a number of demand management measures that need to be taken to ensure continued sustainable sources of water supply.

3.5.12 The Environment Agency (EA) prepares Abstraction Licensing Strategies (ALS) through its Catchment Abstraction Management Strategy (CAMS) process. These ALSs are prepared for each sub-catchment within a river basin. The CAMS process aims to assess the amount of water available for further abstraction licensing, taking into account environmental needs and implementation of the RBMPs and water abstraction plans[79]. The CAMS process is published in a series of ALSs for each river basin. ALS are important in relation to the RBMP as they assist in determining current and future pressures on water resources and how the supply and demand will be managed by the relevant water companies through WRMPs.

3.5.13 For the purposes of water resource planning, the area is divided into Water Resource Zones (WRZs). WRZs are defined by the EA as the "largest possible zone in which customers share the same risk of a resource shortfall"[80]. These WRZs have been amalgamated into larger sub-regional supply areas. The Plan area is served by the Wolverhampton WRZ and the Shelton WRZ, both supplied by Severn Trent Water (see **Figure 3.2**). Water abstraction occurs within these WRZs and therefore any hydrologically sensitive European sites within the WRZs served by the Plan area are considered likely to have a potentially significant water quantity effect as a result of development within the WLP. As such, these hydrologically sensitive European sites are scoped into this assessment for further consideration in the HRA process (see **Table 3.3**).

[76] JBA Consulting (2020) Black Country Councils Water Cycle Study: Phase 1 Draft.

[77] Severn Trent Water (2019) Waste Resources Management Plan 2019. Available at: https://SLP.stwater.co.uk/content/dam/stw-plc/our-plans/severn-trent-water-resource-management-plan.pdf [Accessed: 26/05/24].

[78] Severn Trent Water. Draft Waste Resources Management Plan 2024. Available at: https://www.severntrent.com/about-us/our-plans/water-resources-management-plan/dwrmp24-draft-documents/ [Accessed 11/06/24].

[79] DEFRA (2021) Policy Paper: Water Abstraction Plan.

[80] Severn Trent. A1 Water Resource Zones. Available at: https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://www.severntrent.com/content/dam/stw/ST_Corporate/About_us/Docs/Appendix-A-How-much-water-do-we-have-

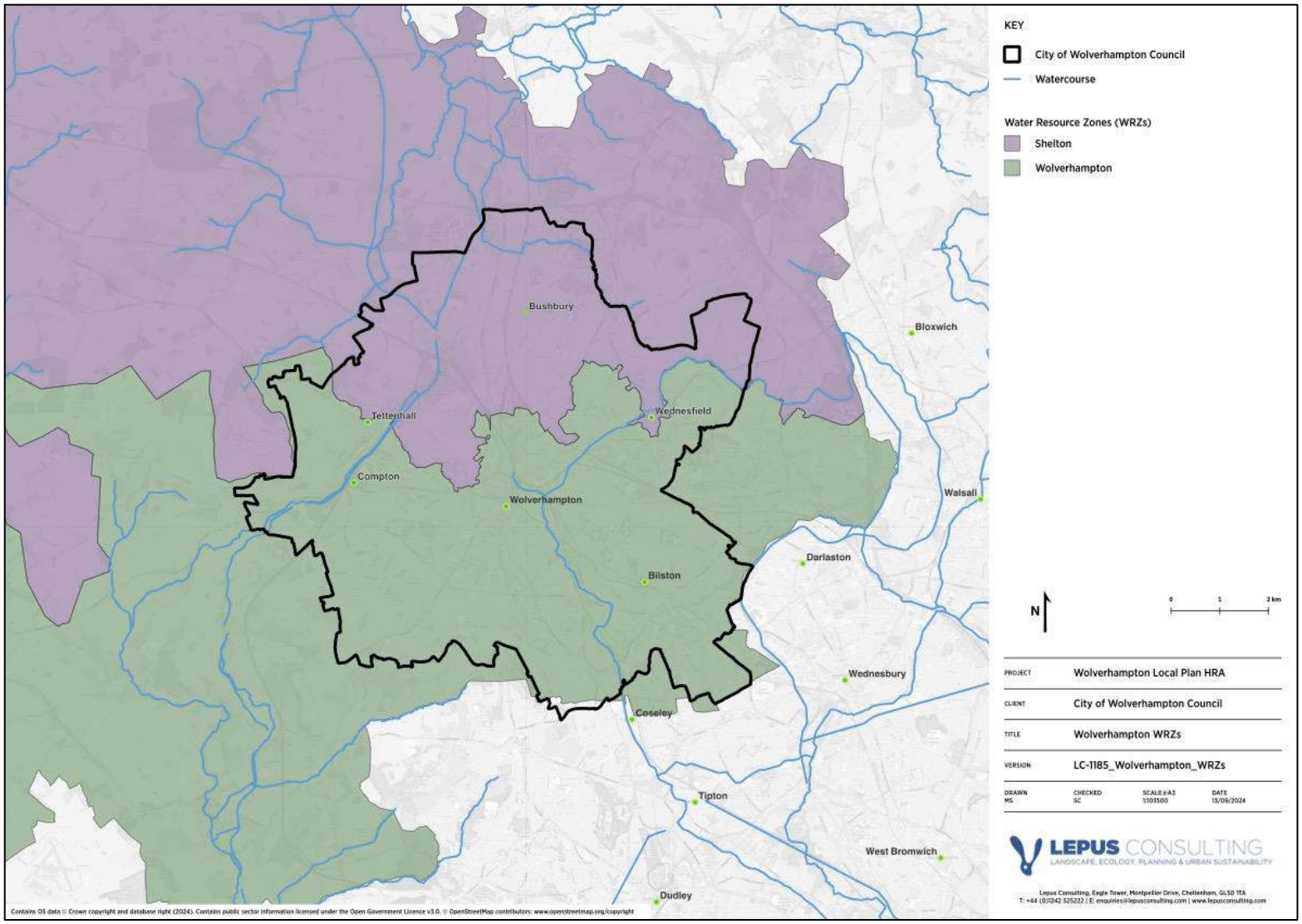

Figure 3.2: *Water Resource Zones (WRZs) in relation to the Plan area*

3.5.14 As part of the evidence base that supported the now withdrawn draft BCP, a Water Cycle Study (WCS) was prepared[81]. This was undertaken through consultation with Severn Trent Water, the EA and neighbouring LPAs. Through this work, Severn Trent Water advised that if growth in the Black Country was in line with their forecast, then they do not have concerns regarding water resources. Severn Trent Water stated that they do not have concerns about the level of growth within their Water Resource Zone (WRZ).

3.5.15 Severn Trent Water is the statutory sewerage undertaker for Wolverhampton. The role of the sewerage undertaker includes the collection and treatment of wastewater from domestic and commercial premises, and in some areas, it also includes the drainage of surface water from building curtilages to combined or surface water sewers.

3.5.16 Severn Trent Water were engaged to carry out a Wolverhampton Wastewater Treatment Works and Network Assessment, to address issues raised in the Black Country Phase 1 Scoping Water Cycle Study and Reg 18 representations by Environment Agency regarding water quality issues. At a meeting on 2 October 2024, the Environment Agency indicated that they were satisfied with the level of evidence provided by this Assessment, subject to review of the final WLP (Regulation 19) and all supporting evidence.

3.5.17 As noted in **paragraph 3.5.4**, the Plan area predominantly falls within hydrological catchments associated with the Severn Estuary and the Humber Estuary. The qualifying features of the Severn Estuary SAC include, among other features, a number of species of migratory fish including Twaite Shad (*Alosa fallax*), River Lamprey (*Lampetra fluviatilis*) and Sea Lamprey (*Petromyzon marinus*). Criterion 4 of the Severn Estuary Ramsar designation notes that the site is important for the run of migratory fish between sea and river via estuary, including the SAC species (listed earlier) and additional species of Salmon (*Salmo salar*), Sea Trout (*S. trutta*) and Allis Shad (*Alosa alosa*).

3.5.18 The 'Unlocking the Severn' project[82], which is run in partnership between the Canal and Rivers Trust, the Severn Rivers Trust, the Environment Agency and Natural England, has created four new fish passes along the River Severn in Worcestershire to allow fish to migrate upstream. Work is also being undertaken as part of the project to monitor fish. This has shown that sufficient numbers of Twaite Shad can pass weir barriers aided by the tides. The River Severn RBMP sets out several catchment partnership measures for upper reaches of the Avon, which include creation of fish passes to reduce barriers to fish movement further up the River Severn catchment[83].

3.5.19 Migratory fish species associated with the Humber Estuary SAC and the Humber Estuary Ramsar are Sea Lamprey and River Lamprey. River Lamprey have been recorded as far upstream as the River Dove (on the Staffordshire/Derbyshire border).

[81] JBA Consulting (May 2020) Black Country Councils Water Cycle Study: Scoping Study - Final Available at: https://blackcountryplan.dudley.gov.uk/t2/p4/t2p4h/ [Accessed: 16/07/24].

[82] Rivers and Canals Trust. Unlocking the Seven Project. Available at: https://unlockingthesevern.co.uk/our-fish-passes/ [Date Accessed: 24/10/24].

[83] Environment Agency (2022) Severn River Basin Management Plan. https://www.gov.uk/guidance/severn-river-basin-district-river-basin-management-plan-updated-202 [Date Accessed: 24/10/24].

3.5.20 Any potential deterioration in water quality or habitat outside the Severn Estuary and Humber Estuary SAC and Ramsar designations as a result of the WLP may have implications for the migration of fish to upstream spawning habitat if it results in a barrier to movement. The impact of the WLP upon functionally linked watercourses and habitat through a deterioration in water quality, flows and loss and / or deterioration of riparian and in-stream habitat may therefore have adverse effects on the achievement of the conservation objectives which aim to maintain and restore the condition of these features for relevant qualifying species. Natural England considers that Good Ecological Status under the WFD is an appropriate standard for functionally linked watercourses[84].

3.5.21 **Table 3.3** identifies European sites which are both hydrologically connected to the Plan area, and which were identified through a detailed review of site information as being vulnerable to hydrological impacts.

Table 3.3: Review of hydrological impact pathways to European sites within the influence of the WLP

Hydrologically sensitive European site with hydrological links to the Plan area	Potential for water quality LSEs	Potential for water quantity impacts LSEs	Will the European site be scoped in for further assessment in the HRA process?
Cannock Chase SAC	Cannock Chase SAC is located approx. 11.8km to the north of the Plan area. The SAC is upstream of the Plan area. Therefore, it is unlikely to be affected by a change in water quality from growth in the Plan area.	Cannock Chase SAC is not located within the same WRZ catchment as the Plan area and therefore there are unlikely to be impacts upon water quantity from water abstraction associated with WLP growth.	No
Cannock Extension Canal SAC	Cannock Extension Canal SAC is located approx. 5.7km to the east of the Plan area. The SAC is fed by the Chasewater reservoir which is part of the Chasewater Southern Staffordshire Coalfield Heaths SSSI and located upstream of the Plan area. The Cannock Extension Canal SAC is hydrologically linked to the Wyrley and Essington Canal, which extends into the Plan area. The Wyrley and Essington Canal is a contour canal, where the canal follows the contours of the land with no intervening locks. There are numerous discharges into the Wyrley and Essington Canal, which could potentially impact water quality at the SAC and therefore water quality will be assessed further in the HRA process.	Cannock Extension Canal SAC is not located within same WRZ catchment as the Plan area and therefore there are unlikely to be impacts upon water quantity from water abstraction associated with WLP growth.	Yes

[84] Defra (2014) Water Framework Directive implementation in England and Wales: new and updated standards to protect the water environment (publishing.service.gov.uk). Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/307788/river-basin-planning-standards.pdf [Accessed 10/06/24].

Hydrologically sensitive European site with hydrological links to the Plan area	Potential for water quality LSEs	Potential for water quantity impacts LSEs	Will the European site be scoped in for further assessment in the HRA process?
Fens Pools SAC	Fens Pool SAC is located approx. 4.8km to the south of the Plan area. Water is supplied to Fens Pools SAC from rainfall, run-off from neighbouring residential areas and inputs from springs to the north eastern corner of the site[85]. The ponds within Fens Pools SAC are hydrologically connected to each other and then feed into the Stourbridge Canal. Consultation at Regulation 18 has indicated that the ground levels are elevated between the Fens Pools SAC and the WLP boundary with several intervening upslope lock fights[86]. Therefore, water quality at the SAC from development set out in the WLP will be assessed further in the HRA process.	Fens Pools SAC is not located within the same WRZ catchment as the Plan area and therefore there are unlikely to be impacts upon water quantity from water abstraction associated with WLP growth.	Yes
Humber Estuary SAC, SPA and Ramsar	The Plan area is located within the Humber River Basin District. Watercourses draining the Plan area are linked to the downstream Humber Estuary designations. Given the location of the Plan area 140km to the south east of the Estuary it is unlikely that there will be direct water quality effects upon these downstream designations. However, the SAC and Ramsar designations support species of migratory fish which have the potential to move into the upper catchment for spawning and are sensitive to changes in water quality that may be caused by the WLP. Therefore, water quality pathways of impact will be considered further in the HRA process.	The Humber Estuary SAC and Ramsar is not located within the same WRZ catchment as the Plan area and therefore there are unlikely to be impacts upon water quantity from water abstraction associated with WLP growth.	Yes

[85] Correspondence with Dudley Council Countryside Services Team on 19th June 2024.

[86] Canal and River Trust (2024) Wolverhampton Local Plan – Issues & Preferred Options (Regulation 18) Public Consultation Letter. 09 April 2024.

Hydrologically sensitive European site with hydrological links to the Plan area	Potential for water quality LSEs	Potential for water quantity impacts LSEs	Will the European site be scoped in for further assessment in the HRA process?
Midland Meres & Mosses Phase 1 Ramsar (Berrington Pool, Shropshire SSSI)	Berrington Pool SSSI of the Midland Meres & Mosses Phase 1 Ramsar is located approx. 25km to the west of the Plan area. The Ramsar is located upstream of the Plan area and is therefore not hydrologically linked. Therefore, it is unlikely to be affected by a change in water quality from growth in the Plan area.	The Berrington Pool SSSI component of the Midland Meres & Mosses Phase 1 Ramsar is located within the Shelton WRZ. Midland Meres & Mosses Phase 1 Ramsar sites include a wide range of lowland wetland types and successional stages, supporting a number of rare wetland plant species and invertebrates[87]. Therefore, the site is sensitive to changes in water levels. As a result, there is potential for water quantity impacts as a result of the WLP and associated water abstraction for new development.	Yes
Midland Meres & Mosses Phase 1 Ramsar (Bomere, Shomere and Betton Pools SSSI)	Bomere, Shomere and Betton Pools SSSI of the Midland Meres & Mosses Phase 1 Ramsar is located approx. 37km to the west of the Plan area. The Ramsar is not hydrologically linked to the Plan area. Therefore, it is unlikely to be affected by a change in water quality from WLP growth.	The Bomere, Shomere and Betton Pools SSSI component of the Midland Meres & Mosses Phase 1 Ramsar is located within the Shelton WRZ. Midland Meres & Mosses Phase 1 Ramsar sites include a wide range of lowland wetland types and successional stages, supporting a number of rare wetland plant species and invertebrates. Therefore, the site is sensitive to changes in water levels. As a result, there is potential for water quantity impacts as a result of the WLP and associated water abstraction for new development.	Yes
Midland Meres & Mosses Phase 1 Ramsar (Marton Pool, Chirbury SSSI)	Marton Pool SSSI of the Midland Meres & Mosses Phase 1 Ramsar is located approx. 56km to the west of the Plan area. The Ramsar is not hydrologically linked to the Plan area. Therefore, it is unlikely to be affected by a change in water quality from WLP growth.	The Marton Pool, Chirbury SSSI component of the Midland Meres & Mosses Phase 1 Ramsar is located within the Shelton WRZ. Midland Meres & Mosses Phase 1 Ramsar sites include a wide range of lowland wetland types and successional stages, supporting a number of rare wetland plant species and invertebrates. Therefore, the site is sensitive to changes in water levels. As a result, there is potential for water quantity impacts as a result of the WLP and associated water abstraction for new development.	Yes

[87] JNCC (1994) Midland Meres and Mosses Phase 1 Information Sheet on Ramsar Wetlands (RIS). Available at: https://jncc.gov.uk/jncc-assets/RIS/UK11043.pdf [Accessed 13/09/24].

Hydrologically sensitive European site with hydrological links to the Plan area	Potential for water quality LSEs	Potential for water quantity impacts LSEs	Will the European site be scoped in for further assessment in the HRA process?
Midland Meres & Mosses Phase 2 Ramsar (Aqualate Mere SSSI)	Aqualate Mere SSSI of the Midland Meres & Mosses Phase 2 Ramsar is located approx. 19km downstream of the Plan area. The Shropshire Union Canal flows through the north of the Plan area, in a northerly direction towards the Ramsar site. However, the canal is located approximately 2km from the Ramsar site. Given this distance, it is unlikely that the Ramsar site is directly linked via water quality pathways to the Plan area. It is therefore unlikely to be affected by a change in water quality from WLP growth.	The Aqualate Mere SSSI component of the Midland Meres & Mosses Phase 2 Ramsar is located within the Shelton WRZ. Midland Meres & Mosses Phase 2 Ramsar sites include a wide range of lowland open water and peatland sites, supporting nationally important flora and fauna. Therefore, the site is sensitive to changes in water levels. As a result, there is potential for water quantity impacts as a result of the WLP and associated water abstraction for new development.	Yes
Midland Meres & Mosses Phase 2 Ramsar (Hencott Pool SSSI)	Hencott Pool SSSI of the Midland Meres & Mosses Phase 2 Ramsar is located approx. 40km to the north west of the Plan area and located 1.4km from the nearest watercourse. The Ramsar is not hydrologically linked to the Plan area. Therefore, it is unlikely to be affected by a change in water quality from WLP growth.	The Hencott Pool SSSI component of the Midland Meres & Mosses Phase 2 Ramsar is located within the Shelton WRZ. Midland Meres & Mosses Phase 2 Ramsar sites include a wide range of lowland open water and peatland sites, supporting nationally important flora and fauna. Therefore, the site is sensitive to changes in water levels. As a result, there is potential for water quantity impacts as a result of the WLP and associated water abstraction for new development.	Yes
Mottey Meadows SAC	Mottey Meadows SAC is located approx. 10km downstream of the Plan area. The Shropshire Union Canal flows through the north of the Plan area, in a northerly direction towards the SAC. However, the canal is located approximately 850m from the SAC. Given this distance, it is unlikely that the SAC is directly linked via water quality pathways to the Plan area. It is unlikely to be affected by a change in water quality from WLP growth.	Mottey Meadows SAC is located within the Shelton WRZ. The SIP for the SAC indicates that the grassland communities are dependent on precise hydrological regimes[88]. Therefore, there is potential for water quantity impacts as a result of the WLP and associated water abstraction for new development.	Yes

[88] Natural England (2014) Site Improvement Plan: Mottey Meadows. Available at: https://publications.naturalengland.org.uk/file/5135117454409728 [Accessed 13/09/24].

Hydrologically sensitive European site with hydrological links to the Plan area	Potential for water quality LSEs	Potential for water quantity impacts LSEs	Will the European site be scoped in for further assessment in the HRA process?
Severn Estuary SAC, SPA and Ramsar	The Plan area is located within the Severn River Basin District. Watercourses draining the Plan area will ultimately drain to the Severn Estuary. Given the location of the Plan area 88km to the northeast of the Estuary, it is unlikely that there will be direct water quality effects upon these downstream designations. However, the downstream SAC and Ramsar designations support species of migratory fish which have the potential to move into the upper catchment for spawning and are sensitive to changes in water quality that may be caused by the WLP. Therefore, water quality pathways of impact will be considered further in the HRA process.	The Severn Estuary SAC and Ramsar is not located within the same WRZ catchment as the Plan area and therefore there are unlikely to be impacts upon water quantity from water abstraction associated with WLP growth.	Yes

3.5.22 In summary, the following European sites have been scoped in for further consideration of water quality and water quantity impacts in the AA:

- Cannock Extension Canal SAC
- Fens Pools SAC
- Humber Estuary SAC
- Humber Estuary Ramsar
- Midland Meres & Mosses Phase 1 Ramsar
- Midland Meres & Mosses Phase 2 Ramsar
- Mottey Meadows SAC
- Severn Estuary SAC
- Severn Estuary Ramsar

3.6 Recreational pressure

3.6.1 Increased recreational pressure at European sites can result in damage to habitats through erosion and compaction, troubling of grazing stock, causing changes in behaviour to animals such as birds at nesting and feeding sites, spreading invasive species, dog fouling and tree climbing etc.

3.6.2 A common approach taken across the UK to address recreational impacts at European sites is to establish a Zone of Influence (ZOI) based on detailed visitor survey data. The ZOI is the area within which there are likely to be significant effects arising from recreational activities undertaken by additional residents due to growth. This is often calculated by taking the distance at which 75% of interviewees surveyed have travelled to reach a particular site (based on a review of visitor survey data).

3.6.3 The broad principle of buffer zones is one component of the HRA screening process for recreational pressures. This process also takes into consideration other factors such as recreational management at sites, proximity to settlements and existing recreational resources. Where available, buffer distances have been applied to determine potential pathways of recreational and urbanisation effects from the WLP.

3.6.4 The recreational draw of a European site depends on a number of factors. These include the extent and range of facilities provided (in particular parking), accessibility both within the European site and links to the wider area, incorporation of a European site as part of a wider designation, such as a National Park, and the site's promotion.

3.6.5 A review of recreational impact assessments undertaken for other European sites across the UK indicates visitors typically live within 4.2 km (overall median value) of nature conservation sites and that the majority (75%) live within 12.6 km[89]. However, this review recognises that some visitors are prepared to travel longer distances to visit particular sites, for instance coastal and wetland sites. As such, a precautionary distance of 15km has been applied to the scoping of European sites at which there may be potential recreational impact pathways.

3.6.6 Fens Pools SAC is located approximately 4.8km south of the Plan area and is surrounded by urban development with two Public Rights of Way (PRoW) and an off-road cycle route running through the centre. It is also designated as a Local Nature Reserve (LNR) – Buckpool and Fens Pool LNR. No visitor surveys have been undertaken for the SAC and no recreational ZOI has been established. Natural England's Supplementary Advice[90] for the SAC and consultation with the Countryside Services team at Dudley Council indicates that a key management issue is anti-social behaviour rather than recreational impacts. As such, given the distance of the Plan area from the SAC, it is considered that there will be no LSEs from the WLP from recreation impacts.

3.6.7 Cannock Extension Canal SAC is located approximately 5.7km to the east of the Plan area. Natural England's SIP[91] for the SAC does not indicate that it is sensitive to recreational impacts. Given the presence of other sections of the canal network in closer proximity to Wolverhampton, it is considered that the WLP will have no LSE upon this SAC in terms of recreational impacts.

[89] Weitowitz, D, C. Panter, C. Hoskin, R. and Liley, D. (October 2019) The effect of urban development on visitor numbers to nearby protected nature conservation sites. Journal of Urban Ecology, Volume 5, Issue 1.

[90] Natural England (2017) Conservation Objectives Supplementary Advice Fens Pools SAC. Available at: https://designatedsites.naturalengland.org.uk/TerrestrialAdvicePDFs/UK0030150.pdf [Accessed 28/08/24].

[91] Natural England (2014) Site Improvement Plan: Cannock Extension Canal. Available at: https://publications.naturalengland.org.uk/publication/6103368296562688 [Accessed 18/06/24].

3.6.8 At Cannock Chase SAC, recreational impacts are known to be an issue for features for which the SAC is designated[92,93]. To manage identified recreational pressures, the Cannock Chase SAC Partnership (composed of 6 Local Planning Authorities, Staffordshire County Council, Natural England, and a number of key stakeholders) was formalised under a Memorandum of Understanding (MOU) in 2016. The MOU sets out a suite of Strategic Access Management and Monitoring Measures (SAMMM) which are funded through financial contributions from new housing developments within 8km of the SAC (the zone within which most frequent visitors originated). In 2017 the Cannock Chase SAC stage 1 Planning Evidence Base Review (PEBR) was undertaken to act as a 'health check' upon the SAMMM, to review the current situation, check if the SAMMM was still fit for purpose, and act as a platform for further work going forward[94]. Since the 2017 review, a further evidence base has been undertaken including updated visitor surveys[95]. It identifies a 15km recreational ZOI (see **Figure 3.3**). Parts of Wolverhampton lie within this area and therefore it will be scoped in for further consideration of recreational LSEs in the HRA process.

[92] J. White, R. McGibbon & J. Underhill-Day (2012) Impacts of Recreation to Cannock Chase SAC. Unpublished report. Footprint Ecology.

[93] Liley, D., Underhill-Day, J., White, J. & Sharp, J. (2009) Evidence Base relating to Cannock Chase SAC and the Appropriate Assessment of Local Authority Core Strategies. Footprint Ecology.

[94] Hoskin, R. and Liley, D. (2017) Cannock Chase SAC Planning Evidence Base Review. Unpublished report for the Cannock Chase SAC Partnership.

[95] Panter, C & Liley, D., (2019) Cannock Chase Visitor Survey 2018. Unpublished report by Footprint Ecology for the Cannock Chase SAC Partnership.

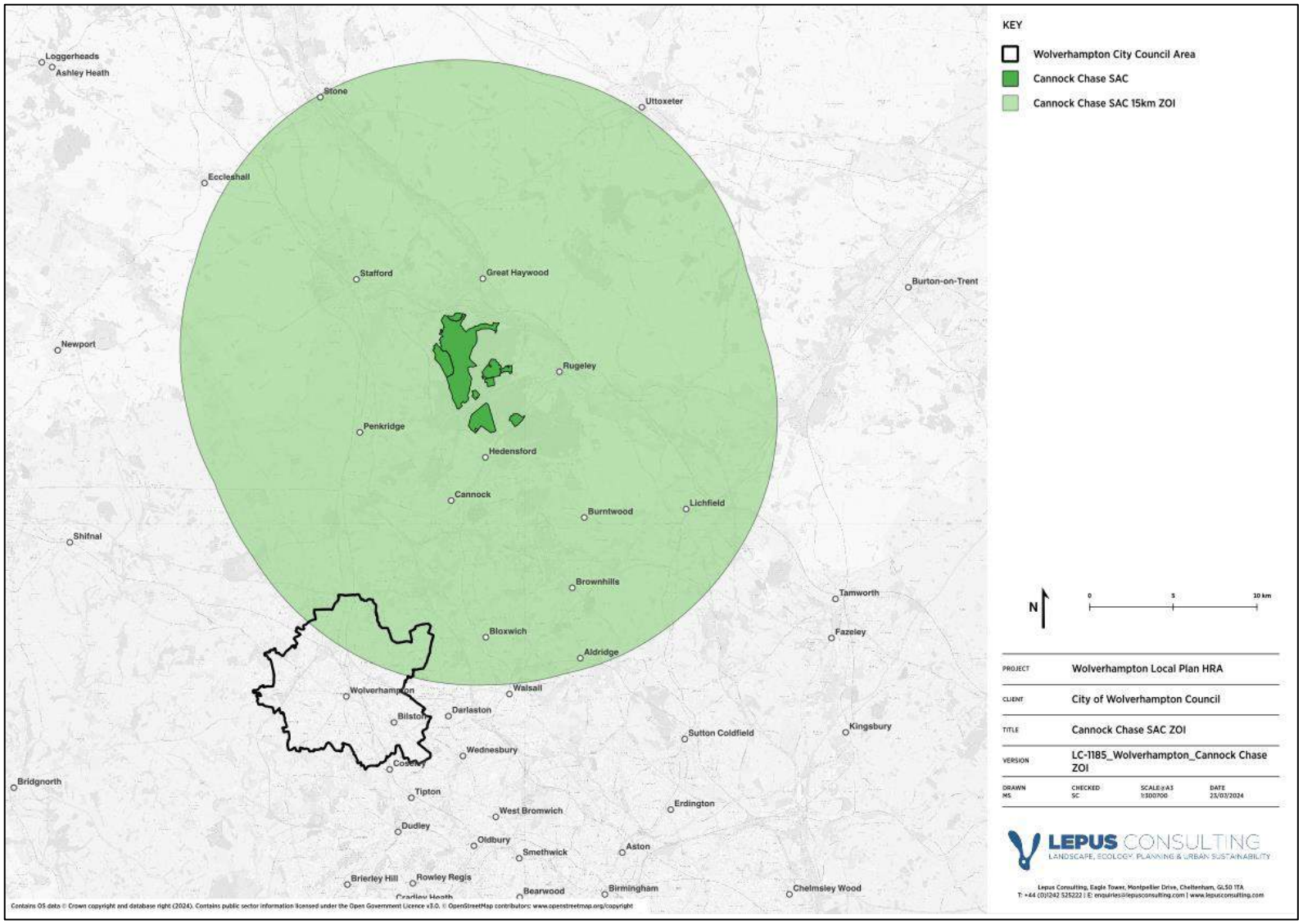

Figure 3.3: *Cannock Chase SAC Recreational Zone of Influence (ZOI)*

3.6.9 Mottey Meadows SAC is located approximately 10.5km from the Plan area. Public access and disturbance is not identified as a threat/pressure at Mottey Meadows SAC within the SIP[96] or Natural England's Supplementary Advice[97]. Public access to the site is limited to permit holders apart from guided walks and there are no car parks within the immediate area. Given these factors, it is considered unlikely that growth in the WLP will have a recreational LSE on the SAC.

3.6.10 In summary, Cannock Chase SAC has been scoped in for further consideration of recreational impacts in the AA.

3.7 Urbanisation effects

3.7.1 Urbanisation effects typically occur when development is located close to a European site boundary. These may include impacts such as noise disturbance, lighting effects, cat predation, fly-tipping, wildfire, littering and vandalism. Strategic mitigation schemes elsewhere in the UK have set a presumption against development (i.e. no net increase in residential dwellings) on the basis of site-specific evidence to safeguard against these impacts.

3.7.2 As with recreational impacts, urbanisation mitigation strategies have been implemented across the UK through the establishment of buffer zones. Commonly applied urbanisation Zones of Influence extend around 400 – 500m from the edge of a designation as this reflects likely impacts from pets (e.g. cat predation) and the distance from which people access a site on foot.

3.7.3 No European sites are located within or within 500m of the Plan area. Therefore, urbanisation effects are scoped out of the HRA AA.

3.8 European sites and threats and pressures

3.8.1 **Figure 3.4** and **Figure 3.5** illustrate the location of European sites scoped into the HRA process for further consideration in the screening assessment (**Chapter 4**).

3.8.2 The impact pathways which have the potential to affect these European sites are summarised in **Table 3.4**. These will form the basis of the HRA screening assessment.

[96] Natural England (2014) Mottey Meadows SIP. Available at: https://publications.naturalengland.org.uk/file/5135117454409728 [Accessed 24/07/24].

[97] Natural England (2018) Mottey Meadows Conservation Objectives Supplementary Advice. Available at: https://designatedsites.naturalengland.org.uk/TerrestrialAdvicePDFs/UK0030051.pdf [Accessed 24/07/24].

Table 3.4: Summary of impact pathways screened in at European sites

Potential impact pathways?	Air quality	Water quality and/or quantity changes	Recreational pressure	Urbanisation impacts
Cannock Chase SAC	Yes	No	Yes	No
Cannock Extension Canal SAC	Yes	Yes	No	No
Fens Pools SAC	Yes	Yes	No	No
Humber Estuary SAC	No	Yes	No	No
Humber Estuary Ramsar	No	Yes	No	No
Midland Meres & Mosses Phase 1 Ramsar	No	Yes	No	No
Midland Meres & Mosses Phase 2 Ramsar	No	Yes	No	No
Mottey Meadows SAC	No	Yes	No	No
Severn Estuary SAC	No	Yes	No	No
Severn Estuary Ramsar	No	Yes	No	No

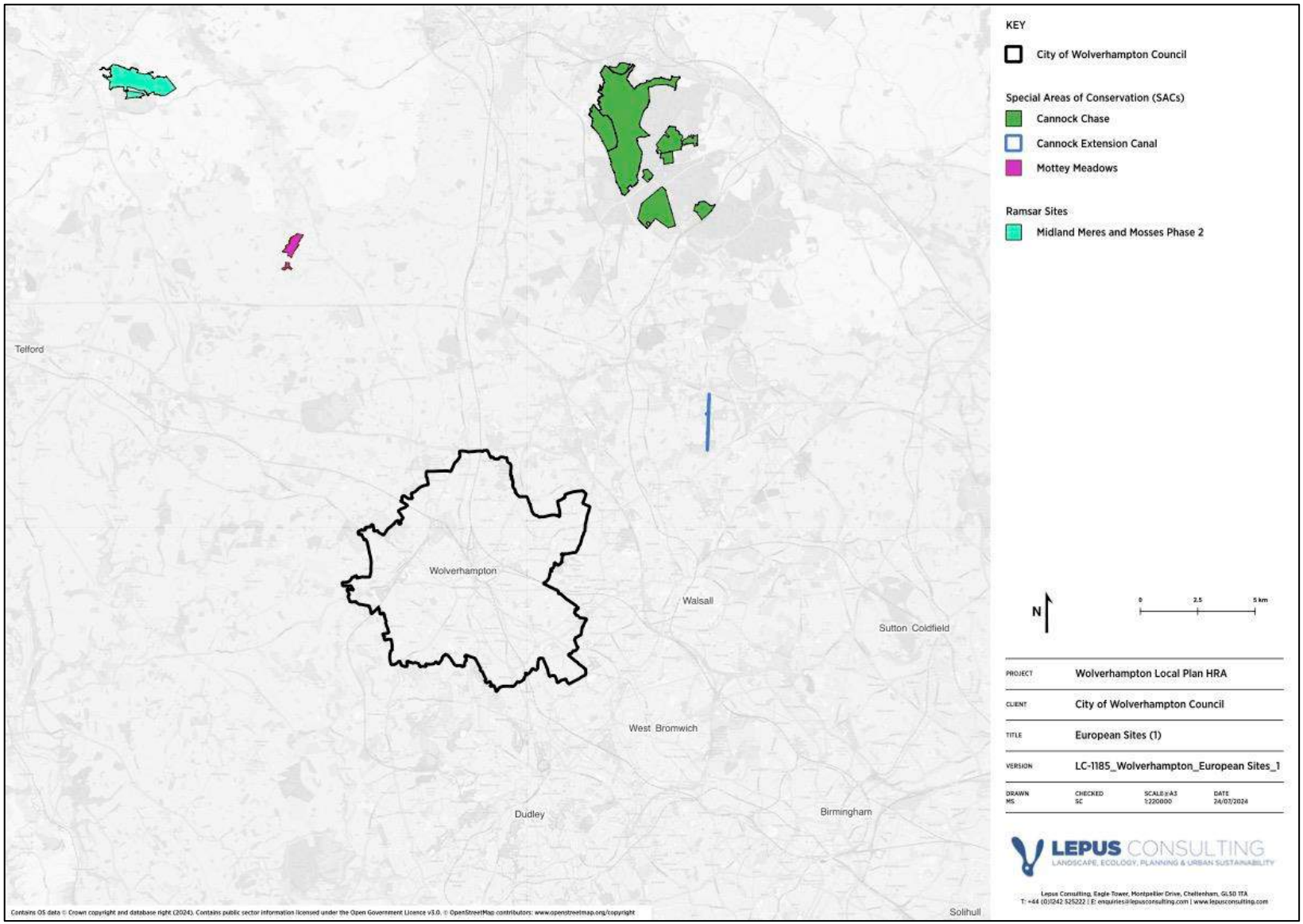

Figure 3.4: *European sites (1) in relation to City of Wolverhampton Council*

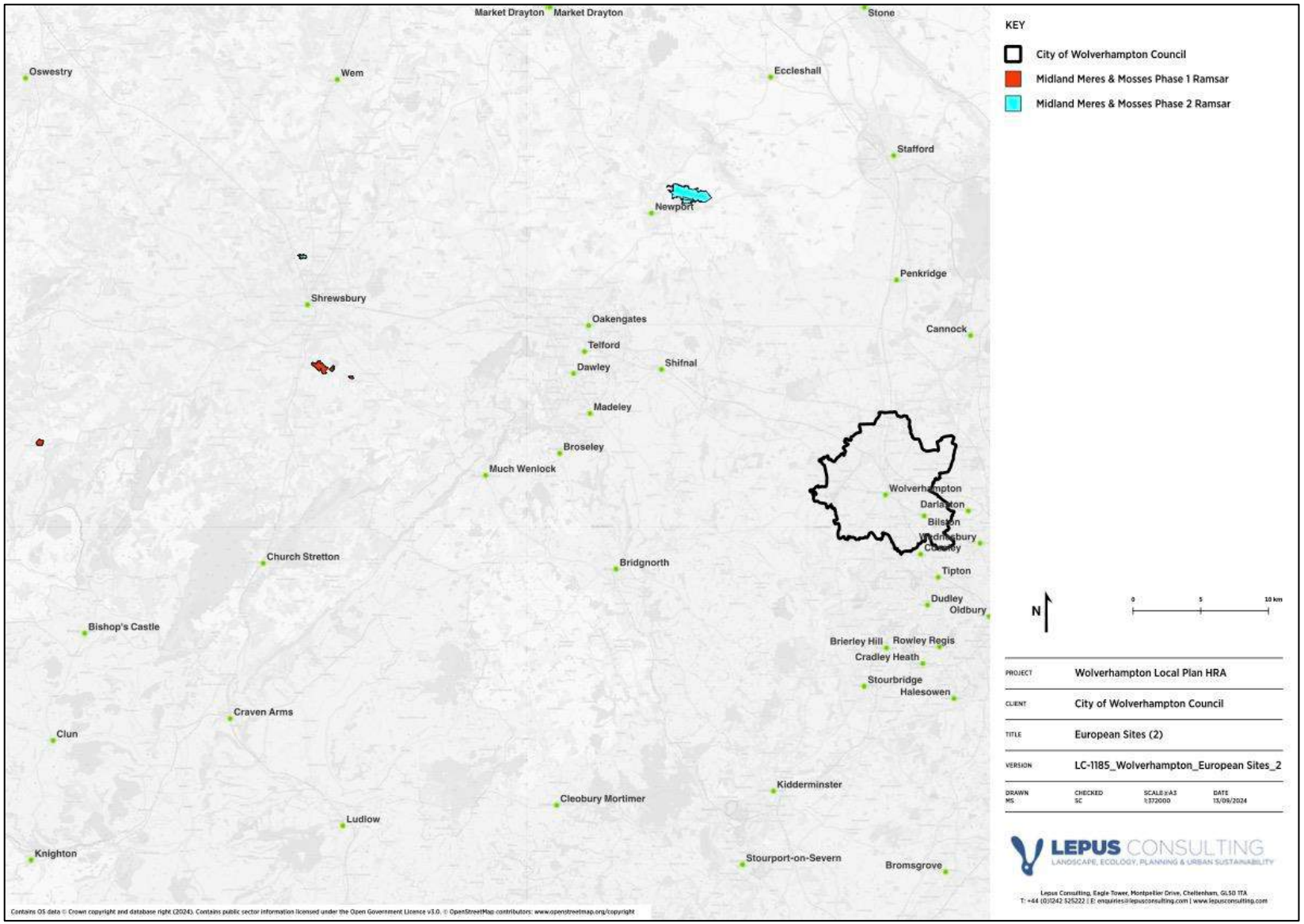

Figure 3.5: *European Sites (2) in relation to City of Wolverhampton Council*

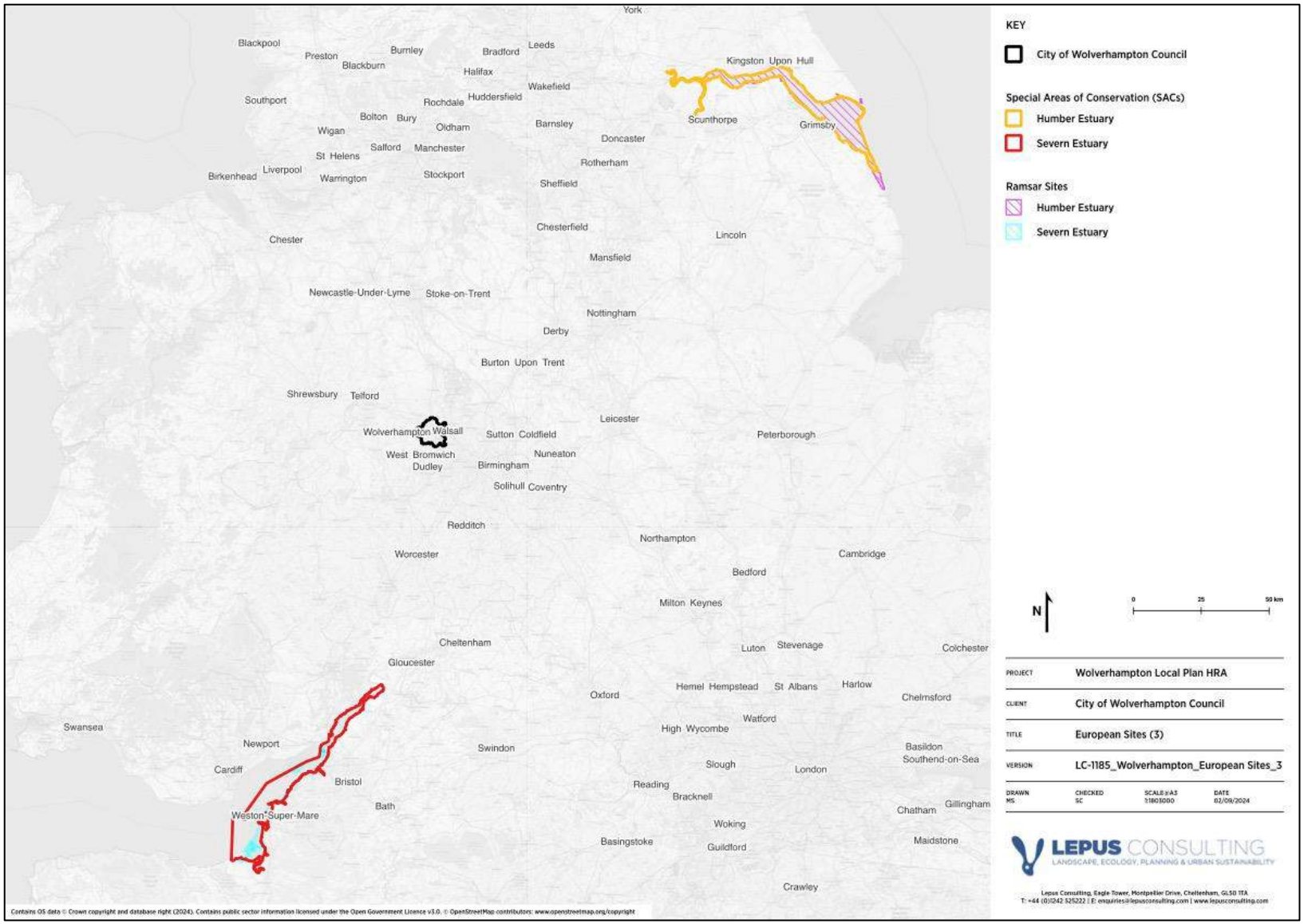

Figure 3.6: *European Sites (3) in relation to City of Wolverhampton Council*

4 Screening of the Regulation 19 Wolverhampton Local Plan

4.1 Policy and allocations screening

4.1.1 Each policy and allocation which forms the WLP has been appraised against the HRA pre-screening criteria (see **Table 2.1**), taking into consideration case law and best practice. **Appendix D** provides the output of this screening exercise. This detailed assessment has informed the test of likely significance i.e. will the WLP have an LSE, alone or in-combination, at a European site.

4.1.2 It is concluded that LSEs, either from the WLP alone or in-combination with other plans or projects, could be screened out for most policies. This is because the policies fall into the following categories:

- Category A: General statements of policy / general aspirations;
- Category B: General criteria for testing the acceptability / sustainability;
- Category D: Environmental protection / site safeguarding; and
- Category F: Policies or proposals that cannot lead to development or other change.

4.1.3 A number of policies were however considered likely to have an LSE on the basis of this assessment as they fall into the following categories:

- Category I: Policies or proposals with a likely significant effect on a site alone;
- Category L: Policies or proposals which might be likely to have a significant effect in combination; and
- Category M: Bespoke area, site or case-specific policies or proposals intended to avoid or reduce harmful effects on a European site.

4.1.4 The following screened in policies (**Table 4.1**) will therefore be explored in the AA (Stage 2 of the HRA process) in more detail.

Table 4.1: Summary of screened in policies (Note: only policies screened into the HRA process have been included in the summary table below. The screening outcome for all policies and allocations is provided at **Appendix D**)

Policy Number	Policy Name	Screening Category
Policy CSP1	Spatial Strategy	L
Policy HOU1	Delivering Sustainable Housing Growth	L
Policy HOU5	Accommodation for Gypsies and Travellers and Travelling Showpeople	L
Policy EMP1	Providing for Economic Growth and Jobs	L
Policy EMP2	Strategic Employment Areas	L
Policy EMP3	Local Employment Areas	L
Policy EMP4	Other Employment Sites	L

Policy Number	Policy Name	Screening Category
Policy CEN2	Wolverhampton's Centres	L
Policy ENV2	Development Affecting Cannock Chase Special Area of Conservation	M
Policy W3	Locational Requirements for New Waste Management Facilities	L

4.1.5 All allocations were considered to have potential in-combination (Category L) LSEs upon European sites and areas of FLL due to air quality and water quality and quantity (**Appendix E**). In addition, three residential allocations (H22, H24c and H24d; see **Figure 7.1**) are located within 15km of Cannock Chase SAC and were therefore considered to have recreation LSEs.

4.1.6 LSEs were identified at the following European sites:

- Cannock Chase SAC – air quality and recreational pressure LSEs;
- Cannock Extension Canal SAC – air quality and water quality/quantity LSEs;
- Fens Pools SAC – air quality and water quality/quantity LSEs;
- Humber Estuary SAC – water quality/quantity LSE;
- Humber Estuary Ramsar – water quality/quantity LSE;
- Midland Meres & Mosses Phase 1 Ramsar – water quantity LSE;
- Midland Meres & Mosses Phase 2 Ramsar – water quantity LSE;
- Mottey Meadows SAC – water quantity LSE;
- Severn Estuary SAC – water quality/quantity LSE;
- Severn Estuary Ramsar – water quality/quantity LSE; and,

4.2 Screening conclusion

4.2.1 As required under Regulation 105 of the Habitats Regulations, an assessment of LSEs of the WLP upon European sites has been undertaken. The screening checks (**Appendix D** and **Appendix E**) indicate that the WLP has the potential to have LSEs on a number of European sites, both alone, and for a number of policies and allocations, in-combination. The WLP is not directly connected with or necessary to the management of any European site. The screening assessment takes no account of mitigation measures that the WLP may incorporate to mitigate adverse impacts upon European sites. It is therefore concluded that the WLP will be screened into the HRA process. The next stage of the HRA process will be Stage 2 - AA.

5 Air Quality Appropriate Assessment

5.1 Introduction

5.1.1 The following section of the AA focuses on assessing more precisely the ecological impacts of air pollution on the following qualifying features of Cannock Chase SAC, Cannock Extension Canal SAC and Fens Pools SAC as set out in **Chapter 3** due to WLP growth alone and in-combination.

5.1.2 The following policies were screened into the HRA process for consideration in an AA due to likely significant air quality impacts (**Appendix D**):

- Policy CSP1 – Spatial Strategy
- Policy HOU1 – Delivering Sustainable Housing Growth
- Policy HOU5 – Accommodation for Gypsies and Travellers and Travelling Showpeople
- Policy EMP1 – Providing for Economic Growth and Jobs
- Policy EMP2 – Strategic Employment Areas
- Policy EMP3 – Local Employment Areas
- Policy EMP4 – Other Employment Sites
- Policy CEN2 – Wolverhampton's Centres
- Policy W3 – Locational Requirements for New Waste Management Facilities

5.1.3 All site allocations set out in the WLP have the potential to act cumulatively to increase traffic flows on the local and wider road network. An increase in traffic related emissions from all allocations cumulatively has the potential to change air quality at European sites both alone and in-combination when considered with growth in neighbouring LPA areas.

5.1.4 This AA follows Natural England's current guidance and therefore assesses the likely effects to inform a conclusion as to whether an adverse effect on site integrity can be ruled out. The assessment also draws on the Chartered Institute of Ecology and Environmental Management (CIEEM's) guidance[98].

5.2 Cannock Chase SAC air quality Appropriate Assessment

Baseline Information

5.2.1 Cannock Chase SAC is the most extensive area of lowland heathland in the Midlands with alder woodland, oak wood pasture and valley mires. The closest point of the designation is located approximately 11.6km to the north-east of the Plan area.

[98] CIEEM (January 2021). Advisory Note: Ecological Assessment of Air Quality Impacts.

5.2.2 The qualifying features of the Cannock Chase SAC is the Northern Atlantic wet heaths with *Erica tetralix* and European dry heaths[99]. Natural England's Supplementary Advice[100] for the SAC notes that the Northern Atlantic wet heath and European dry heath are sensitive to air pollution. It indicates that a change in air quality may modify the chemical status of its substrate, accelerating or damaging plant growth, altering its vegetation structure and composition and causing the loss of sensitive typical species associated with it.

5.2.3 The management target for the qualifying habitats in terms of air quality is to 'restore' the concentrations and deposition of air pollutants to at or below the site-relevant critical load or level given for the features of the site on the Air Pollution Information System (APIS). This 'restore' objective represents current baseline exceedances of critical loads[101].

5.2.4 Cannock Chase SAC is underpinned by the Cannock Chase SSSI which is split into 30 SSSI units. One of these units (035) is in a 'favourable' condition, determined by the condition of its qualifying feature[102]. Three of these units (025, 026 and 028) are in an 'unfavourable no change' condition' and the remaining sites are in an 'unfavourable recovering' condition.

5.2.5 The critical levels and critical load ranges for Cannock Chase SAC, as set out in the Air Quality Report (Table 7 of **Appendix C**), are summarised in **Table 5.1**.

Table 5.1: Critical Loads and Critical Levels at Cannock Chase SAC assessed in the Air Quality Report (**Appendix C**)

European site	Qualifying habitat or habitat upon which qualifying species relies	NOx Annual Critical Level (µg/m^3)	NH_3 Annual Mean Critical Level (µg/m^3)	N Deposition Critical Load (kg N/ha/yr)	Acid N Deposition Critical Load (keq/ha/yr)
Cannock Chase SAC	European dry heaths	30	1	10-20	1.285
Cannock Chase SAC	Northern Atlantic wet heaths with *Erica tetralix*	30	1	10.20	1.285

[99] Natural England (2018) Cannock Chase SAC Conservation Objectives. Available at: https://publications.naturalengland.org.uk/file/4840312833048576 [Accessed 14/08/24].

[100] Natural England (2020) Conservation Objectives Supplementary Advice Cannock Chase SAC. Available at: https://designatedsites.naturalengland.org.uk/TerrestrialAdvicePDFs/UK0030107.pdf [Accessed 14/08/24].

[101] Natural England (2020) Conservation Objectives Supplementary Advice Cannock Chase SAC. Available at: https://designatedsites.naturalengland.org.uk/TerrestrialAdvicePDFs/UK0030107.pdf [Accessed 14/08/24].

[102] Natural England. Designated Sites View: Cannock Chase SSSI. Available at: https://designatedsites.naturalengland.org.uk/SiteUnitList.aspx?SiteCode=S1004497&SiteName=cannock&countyCode=&responsiblePerson=&unitId=&SeaArea=&IFCAArea= [Accessed 14/08/24].

5.2.6 Background (2022) and future year modelled background (2042) NOx concentrations reported in the Air Quality Report (**Appendix C**) are below the annual mean critical levels at Cannock Chase SAC. The annual mean NH_3 background concentrations exceed the relevant critical levels at Cannock Chase SAC. Levels in 2022 are 1.7-2.2 $\mu g/m^3$, remaining the same in 2042[103]. Background nitrogen deposition rates in both the baseline and future years are projected to exceed the respective lower critical loads at the SAC. Levels in 2022 are 17.6-32.5 kgN/ha/yr, with levels in 2042 decreasing to 15.7-29.1 kgN/ha/yr[104]. Background acid deposition rates attributed to nitrogen are above the respective critical loads in 2022 at 1.3 – 2.4 keq/ha/yr with levels in 2042 remaining the same[105].

5.2.7 Two road links were modelled in the air quality modelling at Cannock Chase SAC which exceed the 1,000 AADT screening threshold (see **Section 3.4**). These include the A513 (RAP1) and A460 Rugeley Road (RAP2). Whilst the A513 is not likely to be strategically linked to the Plan area, the A460 is however a primary road linking Wolverhampton and Cannock with the M54, M6 and M6 Toll and is therefore strategically connected to the Plan area. In order to ensure a precautionary approach to this air quality AA both strategic road links have been considered in this assessment. The locations of these road links are illustrated on **Figure 5.1.** Camp Road is an unclassified road link located within 200m of the SAC. This road link is not strategically linked to the Plan area. The 1,000 AADT screening threshold was not exceeded for this road link, however it was included in the air quality model for completeness due to other road locations associated with Cannock Chase SAC exceeding the 1,000 AADT screening threshold (see Table 8, **Appendix C**). .

[103] Sweco (2024) Assessment of Air Quality Impacts on European Sites in Staffordshire, Wolverhampton, Walsall, Sandwell and Dudley.

[104] Sweco (2024) Assessment of Air Quality Impacts on European Sites in Staffordshire, Wolverhampton, Walsall, Sandwell and Dudley.

[105] Sweco (2024) Assessment of Air Quality Impacts on European Sites in Staffordshire, Wolverhampton, Walsall, Sandwell and Dudley.

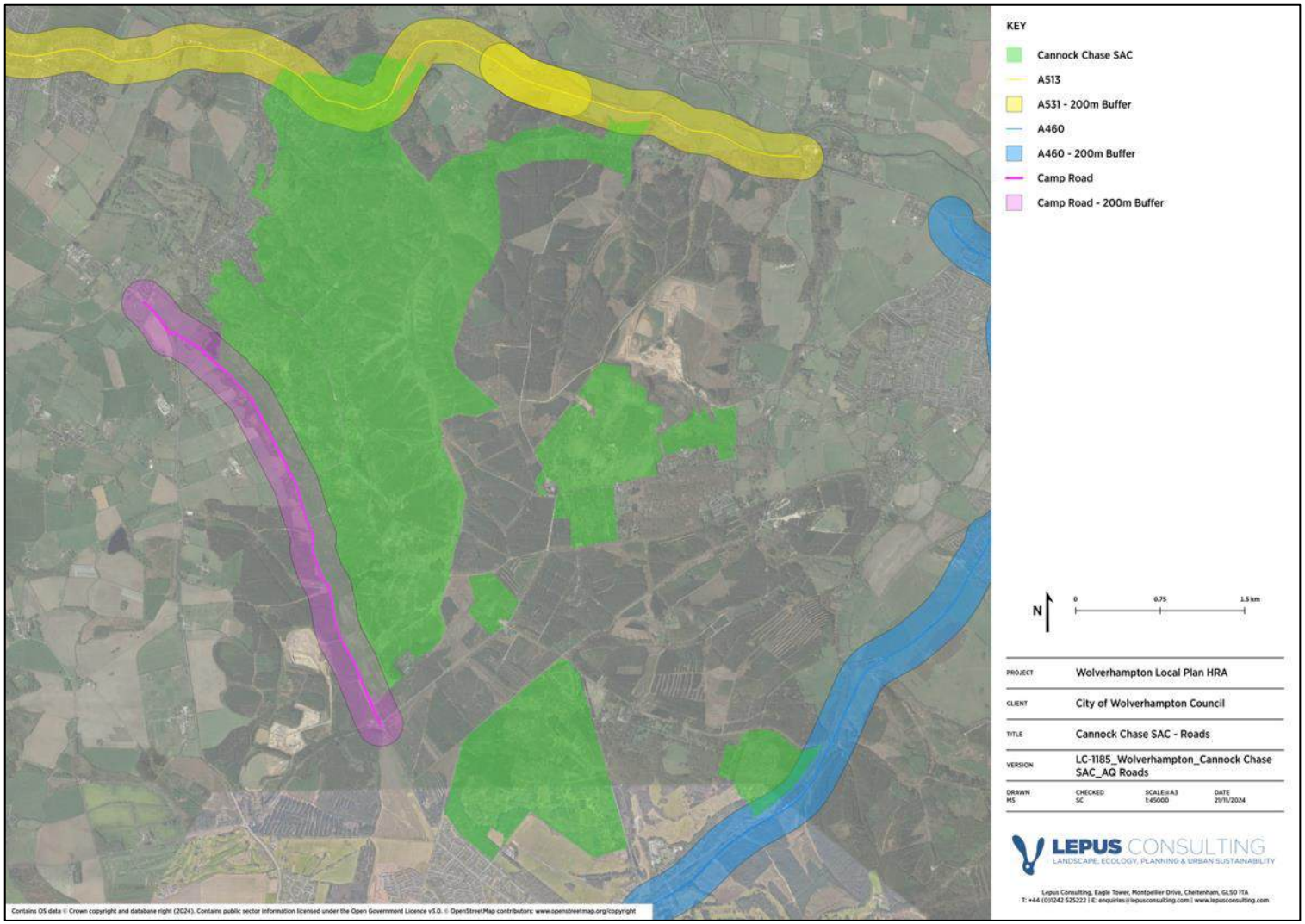

Figure 5.1: *Roads within 200m of Cannock Chase SAC considered in the HRA process*

Appropriate Assessment

5.2.8 As noted in **paragraph 3.4.5**, air quality modelling was commissioned to better define air quality impacts and is reported upon in the Air Quality Report (**Appendix C**). The extent of receptors modelled is illustrated in **Appendix C**. The outputs are presented by the following pollutants: nitrogen oxides, ammonia, nitrogen deposition and acid deposition.

Nitrogen Oxides

5.2.9 The air quality modelling indicates that the maximum modelled annual mean concentration in the 'with plans' scenario (12.6 μg/m^3) remains well below the critical level for NOx (30 μg/m^3). Given there will be no exceedance of the NOx critical level at the SAC and taking into consideration the improvement in trend data (**paragraph 5.4.4**), direct toxicity is not likely to have an adverse impact on the qualifying habitats of the SAC. However, it is necessary to consider the contribution of NOx to nitrogen deposition further through the AA. This will allow a habitat specific assessment of potential impacts associated with emissions.

Ammonia

5.2.10 The Air Quality Report indicates that the maximum modelled annual mean concentration in the 'with plan' scenario is 2.8 μg/m^3, which is above the critical level (1 μg/m^3). This figure includes background concentrations of ammonia and future baseline contributions of ammonia from road sources. This represents a maximum worsening of 0.1 μg/m^3 from the future baseline scenario (2042) of 2.7 μg/m^3.

5.2.11 The modelling results indicate that there is an exceedance of the 1% significance screening criterion within 50m of either side of the A513 (RAP 1), in a narrow band up to 30m within the SAC adjacent to the A460 (Rugeley Road RAP2) and within an even finer band of less than 5m adjacent to Camp Road (RAP 3). These exceedances are illustrated in the Air Quality Report (see Figure 5.1, **Appendix C**).

5.2.12 At the A513 air quality modelling data indicates that the maximum concentration of ammonia at the SAC from a 'with plans' scenario (2.8 μg/m^3) occurs closest to this road link. The concentration decreases with distance from the road source and at 50m is at or below 2.3 μg/m^3. The total maximum contribution to a 'with plans' scenario from roads (i.e. not taking into consideration background levels but taking into consideration contributions from other future baseline road sources along with road source contributions from the local plans) immediately adjacent to the A513 is 0.57 μg/m^3 and at drops below 1% (0.01 μg/m^3 – the significance screening criterion) at 50m.

5.2.13 A similar pattern is experienced within 200m of the A460. The southeastern boundary of the SAC designation is located approximately 60m to the north west of the A460 (see **Figure 5.1**). The maximum concentration of ammonia at the closest part of the SAC from a 'with plans' scenario is 1.8 μg/m^3. This concentration decreases with distance from the road source and beyond 200m is at 1.7 μg/m^3. The total maximum contribution to a 'with plans' scenario from roads (i.e. not taking into consideration background levels but taking into consideration contributions from other future baseline road sources along with road source contributions from the local plans) at the closest point of the SAC to the A460 is 0.1 μg/m^3 which decreases to below 1% of the critical load (0.01 μg/m^3) beyond 30m within the SAC boundary.

5.2.14 As set out in **paragraph 5.2.6**, the annual mean NH_3 background concentrations currently exceed the relevant critical levels at Cannock Chase SAC. Therefore, any increase in ammonia as a result of the WLP alone or in-combination with other plans and projects has the potential to undermine the air quality 'restore' target for the SAC (**paragraph 5.2.3**) and achievement of its conservation objectives (**Appendix B**).

5.2.15 Data available on APIS indicates that ammonia pollution can lead to the direct damage of sensitive species such as lichens, mosses and Heather (*Calluna vulgaris*) in heathland, including senescence[106] and leaf loss. Information also indicates that ammonia exposure can cause life cycle acceleration so that Heather becomes woody and 'leggy' earlier which can encourage invasion by grasses and therefore a change in species composition. Increased ammonia can also cause a change in the composition of ground flora, bryophyte and lichen communities where these are present[107].

5.2.16 Areas where ammonia levels exceed the 1% significance criteria are illustrated on Figure 5.1 of **Appendix C**. As noted in **paragraph 5.2.1**, these areas lie within 50m of either side of the A513 (RAP 1), in a narrow band up to 30m within the SAC adjacent to the A460 (Rugeley Road RAP 2) and within an even finer band of less than 5m adjacent to Camp Road (RAP 3).

5.2.17 As set out in **paragraph 5.1.4** CIEEM's methodology has been followed to allow an ecological assessment of increased ammonia levels at the SAC and implications for achievement of its conservation objectives.

5.2.18 The first step is to confirm the location of qualifying features of the SAC within the areas of exceedance. As set out in **paragraph 5.2.2**, the qualifying features of the Cannock Chase SAC are Northern Atlantic wet heaths with *Erica tetralix* and European dry heaths[108].

5.2.19 Areas of ammonia exceedance associated with the A460, A513 and Camp Road fall within the following Cannock Chase SSSI units (RAP points as set out in **Table 3.2** are also provided below for ease of reference with the Air Quality Report (**Appendix C**) and context).

[106] Deterioration with age.

[107] APIS (2024) Ecosystems Overview: Heath and monane scrub. Available at: https://www.apis.ac.uk/overview/ecosystems/overview_heath.htm [Accessed: 05/09/24].

[108] Natural England (2018) Cannock Chase SAC Conservation Objectives. Available at: https://publications.naturalengland.org.uk/file/4840312833048576 [Accessed 14/08/24].

- A460: SSSI Unit 001 – Moor's Gorse (RAP 02)
- A513: SSSI Unit 020 – Oat Hill (RAP 01)
- A513: SSSI Unit 021 – Sherbrook Alder Car (RAP 01)
- A513: SSSI Unit 022 – Santnall Hills (RAP 01)
- Camp Road: SSSI Unit 010 – German Cemetery (RAP 03)
- Camp Road: SSSI Unit 011 – Anson's Bank (RAP 03)
- Camp Road: SSSI Unit 024 – Brockton LNR (RAP 03)

5.2.20 The main habitat type as quoted on Natural England's designated site viewer[109] within each of these SSSI Units (with the exception of Unit 021) is lowland dwarf shrub heath. The main habitat type within SSSI Unit 021 is lowland broadleaved mixed and yew woodland.

5.2.21 Phase 1 habitat survey data[110] and bryophyte / lichen records was received from Staffordshire Ecological Records Centre for the SAC. South Staffordshire Council's ecologist undertook site visits to a number of areas of exceedance of the 1% screening threshold in October 2024. In addition, consultation was undertaken with Natural England on 14th November 2024. At this meeting Natural England confirmed the extent of heathland monitoring areas which are used by Natural England to inform FCS surveys (as described at **paragraph 3.3.4**) at each of the three RAP points, and in particular within areas of ammonia exceedance.

5.2.22 **Table 5.2** provides a summary of habitat types within the areas of ammonia exceedance within each SSSI Unit (and associated RAP point). It can be seen that qualifying features of the SAC (wet and dry heathland) do not fall within any of the areas of exceedance with the exception of RAP 03.

Table 5.2: Habitat type within areas of ammonia exceedance

SSSI Unit and RAP point	Lichen / Bryophyte Records (within area of ammonia exceedance only)	Phase 1 Habitat data (within area of ammonia exceedance only)	Site visit observations	Natural England consultation outputs (14th November meeting)
001 Moor's Gorse (RAP 02)	None within area of exceedance -	Coniferous Woodland	Not surveyed	Habitat within area of exceedance represents site fabric[111]

[109] https://designatedsites.naturalengland.org.uk/

[110] Habitat survey data provided from Staffordshire Ecological Records Centre ranges from surveys undertaken in 1983 to 2019.

[111] 'Site-fabric' is a general term used by Natural England to describe land and/or permanent structures present within a designated site boundary which are not, and never have been, part of the special interest of a site, nor do they contribute towards supporting a special interest feature of a site in any way, but which have been unavoidably included within a boundary for convenience or practical reasons. Areas of site-fabric will be deliberately excluded from condition assessment and will not be expected to make a contribution to the achievement of conservation objectives. Natural England (2018). Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations. NE Internal Guidance, V1.4 Final, June 2018.

SSSI Unit and RAP point	Lichen / Bryophyte Records (within area of ammonia exceedance only)	Phase 1 Habitat data (within area of ammonia exceedance only)	Site visit observations	Natural England consultation outputs (14th November meeting)
020 - Oat Hill (RAP 01)	None within area of exceedance	Semi-natural broad leaved woodland Continuous bracken Mixed woodland Unimproved acid grassland	Area is almost wholly oak and birch woodland with an understorey of prolific bracken.	Habitat within area of exceedance represents site fabric
021 - Sherbrook Alder Car (RAP 01)	None within area of exceedance	Semi-natural broad leaved woodland Semi-improved neutral grassland	Area is almost wholly oak and birch woodland with an understorey of prolific bracken.	Habitat within area of exceedance represents site fabric
022 - Santnall Hills (RAP 01)	None within area of exceedance	Mixed woodland Dense / continuous scrub Continuous bracken Unimproved acid grassland Dry heath / acid grassland mosaic Semi-natural broad leaved woodland	Area is almost wholly oak and birch woodland with an understorey of prolific bracken.	Habitat within area of exceedance represents site fabric
010 - German Cemetery (RAP 03)	None within area of exceedance	Semi-natural broadleaved woodland Unimproved acid grassland Dry dwarf shrub heath - This area of heathland covers approximately 0.01ha. Mixed woodland	Not surveyed	The area of exceedance is immediately adjacent to Camp Road in the southern area of SSSI Unit 010 and falls within a very small area of Natural England's heath target habitat area. This small area is considered by Natural England to be negligible and unlikely to result in an adverse impact on site integrity at the SAC.
011 - Anson's Bank (RAP 03)	None within area of exceedance	Mixed woodland Semi-natural broadleaved woodland	Not surveyed	No heathland habitat is shown on habitat mapping data in this SSSI component in the area of exceedance.

SSSI Unit and RAP point	Lichen / Bryophyte Records (within area of ammonia exceedance only)	Phase 1 Habitat data (within area of ammonia exceedance only)	Site visit observations	Natural England consultation outputs (14th November meeting)
024 - Brockton LNR (RAP 03)	None within area of exceedance	Mixed woodland Coniferous plantation	Not surveyed	No heathland habitat is shown on habitat mapping data in this SSSI component in the area of exceedance.

5.2.23 Whilst no qualifying habitat is located within the area of exceedance, with the exception of RAP03, it is also important to confirm that in the future habitat may not be restored given appropriate management. South Staffordshire Council's ecologist therefore consulted with landowners and managers at each RAP point in October 2024 to better understand future land management aspirations in these areas.

5.2.24 At RAP 02, land to the north and south of the A513 within the SAC boundary forms part of the National Trust's Shugborough Estate. The National Trust confirmed that there are no ambitions to restore woodland to the immediate north of the A513 (in the areas of exceedance) to heathland. Land to the south of the A513 is predominantly with the National Trust's Shugborough Estate, with a small area to the south west within the ownership of Staffordshire County Council. The National Trust's ambition in this area is to encourage open grown tree planting in the areas of exceedance and not restoration to heathland.

5.2.25 Land at RAP 01 to the north of the A460 is within the ownership of Staffordshire County Council. Consultation with the Cannock Chase SAC Project Officer indicates that the areas of exceedance at this location comprise a valley bottom with a rising brook running through the area. The Cannock Chase SAC Partnership has aspirations to improve the quality and extent of the wetland in this area rather than heathland restoration.

5.2.26 There is no qualifying habitat within RAP 01 or RAP 02 areas. The area of qualifying heathland habitat (wet or dry) within the area of exceedance is not significant in RAP 03 – comprising approximately 0.01ha. Given the absence/ small area of qualifying habitat within the areas of ammonia exceedance and confirmation that these areas will not be restored to heathland in the future, it can be concluded that there will be no in-combination AIOSI at the SAC due to ammonia in relation to reduced air quality caused by the WLP in combination.

5.2.27 It is however necessary to consider the contribution of ammonia to nitrogen deposition and acid deposition further through the AA. This will allow a habitat specific assessment of potential impacts associated with emissions.

Nitrogen Deposition

5.2.28 Nitrogen deposition rates are habitat specific as different habitats have different tolerances to different levels. Exceedances of critical loads for nitrogen deposition may modify the chemical status of the substrate, accelerating or damaging plant growth, altering its vegetation structure and composition and causing the loss of sensitive typical species associated with it. Increased nitrogen deposition is often associated with a marked decline in Heather and an increased dominance of grasses.

5.2.29 The critical load range which has been applied in the air quality modelling for both qualifying features of the SAC, European dry heaths and Northern Atlantic wet heaths with *Erica tetralix* is 10-20kgN/ha/yr[112]. This load range was specified in the Middlemarch work which was agreed with Natural England[113].

5.2.30 The Air Quality Report (**Appendix C**) provides modelled results for nitrogen deposition at each road link for the in-combination (with plans) scenario. This modelling indicates that the 'with plans' scenario will result in an exceedance of the lower critical load range for nitrogen deposition of 10 kgN/ha/yr across the whole SAC. The Air Quality Report notes that this is in part due to the existing high background levels.

5.2.31 A maximum total concentration for the 'with plans' or 'in-combination' scenario is provided in the Air Quality Report in Table 5.4 (**Appendix C**) of 32.7 kgN/ha/yr. This includes background nitrogen deposition levels across the SAC and future base road contributions. A total of 32.7 kgN/ha/yr represents a maximum worsening due to the local plans in-combination of 0.4 kgN/ha/yr from future baseline levels (which are predicted to be 32.3 kgN/ha/yr in 2042).

5.2.32 As set out in **paragraph 3.4.7,** it is widely accepted that air quality impacts are greatest within 200m of a road source, decreasing with distance. The air quality modelling results illustrate that nitrogen deposition levels are higher at receptors immediately adjacent to the A513, with an exceedance of the 1% significance screening criterion within a 40m band on either side of the A512 (RAP 1). These exceedances are illustrated in the Air Quality Report (Figure 6.1, **Appendix C**).

5.2.33 Total concentrations decrease rapidly from the A513 and are below 18.0kgN/ha/yr within 20 to 30m which remains 8kgN/ha/yr over the critical load of 10kgN/ha/yr. The total maximum contribution from road sources (i.e. excluding background levels but including other future baseline road contributions) within 200m of the A513 is 3.6kgN/ha/yr. This decreases with distance from the road and at 40m is 0.4kgN/ha/yr.

[112] It is noted on APIS that the critical load range provided for wet and dry heath at Cannock Chase SAC is 5 – 15 kg/ha/yr.

[113] Middlemarch (2023) Creation of an Air Pollution Evidence Base Brief to Support Local Plan HRA Staffordshire, Wolverhampton, Walsall, Sandwell and Dudley.

5.2.34 At the closest point of the SAC to the A460 (approx. 66m) the maximum total forecast level of nitrogen deposition is 16.5kgN/ha/yr. This concentration decreases with distance from the A460 and at 200m is 16.19kgN/ha/yr. The total contribution from road sources (i.e. excluding background levels but including other future baseline road contributions) at the closest point of the SAC to the A460 is approximately 0.8kgN/ha/yr. This decreases with distance from the road and at 200m from the A460 is 0.4kgN/ha/yr. There were no exceedances of the 1% significance screening criterion within 200m of the A460 or Camp Road.

5.2.35 As set out in **paragraph 5.2.6**, background nitrogen deposition rates in both the baseline and future years are projected to exceed the respective lower critical loads at the SAC. Levels in 2022 are 17.6-32.5 kgN/ha/yr, with levels in 2042 decreasing to 15.7-29.1 kgN/ha/yr[114]. As set out in **Table 5.2**, habitat survey date, site surveys and consultation with Natural England indicates that there is no qualifying heathland habitat within RAP 01. In addition, consultation with landowners and managers in this area (**paragraph 5.2.24**) indicates that there is no aspiration to restore the habitat adjacent to the A513 to heathland habitat.

5.2.36 There is no qualifying habitat within the area of exceedance at RAP 01. Given the of qualifying features within the area of nitrogen deposition exceedance and confirmation that this area will not be restored to heathland in the future, it can be concluded that there will be no in-combination AIOSI at the SAC due to nitrogen deposition in relation to reduced air quality caused by the WLP in combination.

Acidity

5.2.37 The Air Quality Report indicates that the maximum modelled annual acid (N) deposition rates in the 'with plan' scenario (2.607 keqN/ha/yr), which is above the lower critical load (1.285 keqN/ha/yr). This represents a maximum worsening of 0.03 keqN/ha/yr (i.e. not including future traffic contributions or baseline levels). These maximum concentration locations are immediately adjacent to the A513 which reflects the screening results which indicate that there is an exceedance of the 1% significance screening criterion in an area only immediately adjacent to the A513 (RAP 1) that passes through the northern area of the SAC. These exceedances are illustrated in the Air Quality Report (Figure 7.1 **Appendix C**). The majority of these exceedances are located on the carriageway itself or immediately adjacent to it.

5.2.38 At the A513 air quality modelling data indicates that the maximum concentration of acid deposition at the SAC from a 'with plans' scenario along the majority of its length is 1.6 keqN/ha/yr) adjacent to the road verge. This concentration decreases with distance from the road source, and at 50m is at 1.4 keqN/ha/yr. The maximum worsening from roads (i.e. not taking into consideration background levels but including other future road contributions) immediately adjacent to the A513 is 0.03 keqN/ha/yr.

[114] Sweco (2024) Assessment of Air Quality Impacts on European Sites in Staffordshire, Wolverhampton, Walsall, Sandwell and Dudley.

5.2.39 Data on APIS indicates that acid deposition can lead to a change in heathland species composition through reduction in acid sensitive bryophyte species, chemical changes in soil chemistry leading to reduced fertility and nutrient deficiencies and root damage[115].

5.2.40 There is no qualifying habitat within RAP 01. Given the absence of qualifying habitat within the area of acid deposition exceedance and confirmation that this area will not be restored to heathland in the future, it can be concluded that there will be no in-combination AIOSI at the SAC due to acid deposition in relation to reduced air quality caused by the WLP in combination.

[115] SPIS (2024) Pollutants Acid Deposition. Available at: https://www.apis.ac.uk/overview/pollutants/acid-deposition#:~:text=Effects%3A%20Soils&text=Chemical%20changes%20leading%20to%20reduced,%2B%20and%20manganese%20(Mn). [Accessed: 05/09/24].

5.3 Cannock Extension Canal SAC air quality Appropriate Assessment

Baseline Information

5.3.1 Cannock Extension Canal SAC is a rich waterway and part of the extensive inland water system through Birmingham and the Black Country. The closest point of the designation is located approximately 5.6km to the north-east of the Plan area.

5.3.2 The qualifying feature of the Cannock Extension Canal SAC is Floating Water-plantain (*Luronium natans)*[116]. Natural England's Supplementary Advice[117] for the SAC notes that Floating water-plantain is sensitive to air pollution. It indicates that a change in air quality may modify the chemical status of its substrate, accelerating or damaging plant growth, altering its vegetation structure and composition and causing the loss of sensitive typical species associated with it.

5.3.3 The management target for this qualifying habitat in terms of air quality is to 'restore as necessary the concentrations and deposition of air pollutants to at or below the site-relevant Critical Load or Level values given for these features of the site on the Air Pollution Information System'[118]. This 'restore' objective represents current baseline exceedances of critical loads. Any further deterioration therefore of air quality at the SAC as a result of the WLP either alone or in-combination with other plans and projects has the potential to have adverse impacts on the integrity of the SAC.

5.3.4 Cannock Extension Canal SAC is underpinned by the Cannock Extension Canal SSSI which is split into two SSSI units. One of these units (001) is in an 'unfavourable-recovering' condition and the other (002) is in a 'favourable' condition, determined by the condition of its qualifying feature[119]. The 'unfavourable-recovering' condition status relates to the presence of Floating Pennywort (*Hydrocotyle ranunculoides*) and Azolla (aquatic ferns) which are both invasive species that adversely affect the native freshwater ecosystem.

[116] Natural England. (2018) Cannock Extension Canal SAC Conservation Objectives. Available at: https://publications.naturalengland.org.uk/publication/5063623810482176 [Accessed: 04/06/24].

[117] Natural England. (2019) Cannock Extension Canal SAC. Supplementary Advice. Available at: https://designatedsites.naturalengland.org.uk/SiteGeneralDetail.aspx?SiteCode=UK0012672&SiteName=cannock%20extension&countyCode=&responsiblePerson=&SeaArea=&IFCAArea= [Accessed: 04/06/24].

[118] Natural England. (2019) Cannock Extension Canal SAC. Supplementary Advice. Available at: https://designatedsites.naturalengland.org.uk/SiteGeneralDetail.aspx?SiteCode=UK0012672&SiteName=cannock%20extension&countyCode=&responsiblePerson=&SeaArea=&IFCAArea= [Accessed: 04/06/24].

[119] Natural England. Designated Sites View: Cannock Extension Canal SAC. https://designatedsites.naturalengland.org.uk/SiteUnitList.aspx?SiteCode=S1006558&SiteName=cannock%20extension&countyCode=&responsiblePerson=&unitId=&SeaArea=&IFCAArea= [Accessed: 07/08/24].

5.3.5 The Air Quality Report presents critical levels and critical load ranges that represent the environmental benchmarks adopted for each European site according to their qualifying features (Table 7 of **Appendix C**). These critical levels and critical load ranges for Cannock Extension Canal SAC are summarised in **Table 5.3**. It is acknowledged that the critical load range for nitrogen deposition at the SAC (for permanent oligotrophic lakes, ponds and pools (including softwater lakes)) is 2-10kg/N/ha/yr. As noted on APIS, the lower end of this range is intended for boreal and alpine lakes and therefore the upper end of the range has been applied in this AA as it is more appropriate as it applies to Atlantic softwaters.

Table 5.3: Critical Loads and Levels at Cannock Extension Canal SAC assessed in the Air Quality Report (**Appendix C**)

European site	Qualifying habitat or habitat upon which qualifying species relies	NOx Annual Critical Level (µg/m^3)	NH_3 Annual Mean Critical Level (µg/m^3)	N Deposition Critical Load (kg N/ha/yr)
Cannock Extension Canal SAC	Permanent oligotrophic waters: Softwater lakes	30	3	10[120]

5.3.6 The Air Quality Report[121] sets out published Defra and APIS background data relating to annual mean NOx and NH_3 concentrations in addition to annual nitrogen deposition rates at each European sites in Table 6 of **Appendix C** and projects future background levels to 2042. The background (2022) and future background (2042) NOx and NH_3 concentrations are below the annual mean critical levels at Cannock Extension Canal SAC. Background nitrogen deposition rates in both the baseline and future years are projected to exceed the upper critical load at the SAC. Levels in 2022 are 17.2–17.3 kgN/ha/yr, with levels in 2042 decreasing to 15.4-15.5 kgN/ha/yr[122].

5.3.7 Two road links within 200m of Cannock Extension Canal SAC were included in the air quality modelling as they exceeded the 1,000 AADT screening threshold (see **Section 3.4**). These include the A5 Watling Street (RAP 10) and B4154 Lime Street (RAP 11) as illustrated in **Figure 5.1**.

[120] Note: as set out on APIS the upper range of the nitrogen critical load for the SAC has been applied in this assessment as the lower end of the range (2kg/N/ha/yr) applies only to boreal and alpine lakes.

[121] Sweco (2024) Assessment of Air Quality Impacts on European Sites in Staffordshire, Wolverhampton, Walsall, Sandwell and Dudley.

[122] Sweco (2024) Assessment of Air Quality Impacts on European Sites in Staffordshire, Wolverhampton, Walsall, Sandwell and Dudley.

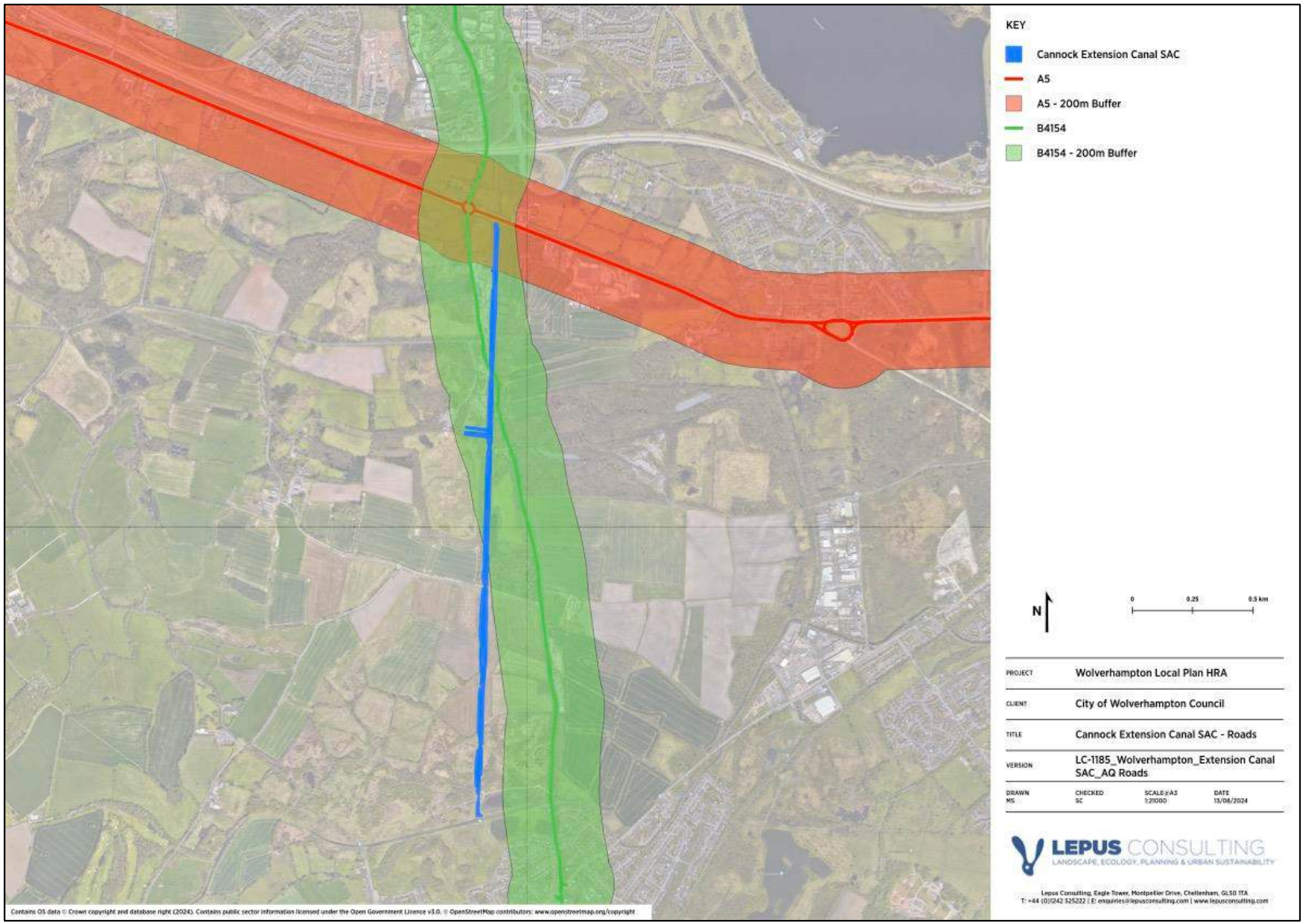

Figure 5.2: *Roads within 200m of Cannock Extension Canal SAC considered in the HRA process*

Appropriate Assessment

Nitrogen Oxides

5.3.8 The air quality modelling indicates that the maximum modelled annual mean concentration in the 'with plans' scenario[123] (21.9 μg/m^3) remains well below the critical level for NOx (30 μg/m^3). Given there will be no exceedance of the NOx critical level at the SAC and taking into consideration the improvement in trend data (**paragraph 5.2.5**), direct toxicity is not likely to have an adverse impact on the qualifying species of the SAC and therefore no adverse impact on site integrity (AIOSI). However, it is necessary to consider the contribution of NOx to nitrogen deposition further through the AA. This will allow a habitat specific assessment of potential impacts associated with emissions.

Ammonia

5.3.9 The Air Quality Report (Figure 5.2, **Appendix C**) provides modelled results for ammonia levels at each road link for the in-combination (with plans) scenario. This indicates that the maximum modelled annual mean concentration in the 'with plans' scenario[124] (3μg/m^3), which was modelled directly adjacent to the A5 Watling Street within the boundary of the road itself, is equal to the critical level (3μg/m^3). This represents a maximum increase of 0.1μg/m^3 from the future baseline scenario (2042) of 2.9μg/m^3.

5.3.10 Modelled air quality data provided in the Air Quality Report (Table 6 **Appendix C)** indicates that forecast concentrations of ammonia are likely to rise, from 1.8μg/m^3 in 2022 to 1.8-1.9μg/m^3 in 2042.

5.3.11 A literature review indicates that Floating Water-plantain is tolerant of a broad range of nutrient environments[125]. It is often described as being characteristic of oligotrophic waters (low nutrient content), however, it is also recorded from meso-oligotrophic, mesotrophic (moderate amount of dissolved nutrients) and meso-eutrophic to eutrophic waters (high amount of dissolved nutrients)[126]. Floating Water-plantain can grow in a variety of forms including the submerged and floating phenotype. These different growth forms are linked to the environmental conditions Floating Water-plantain can tolerate, which also dictate conservation actions. Cannock Extension Canal SAC supports the submerged phenotype, which is less sensitive to the effects of atmospheric deposition of nutrients.

[123] The 'with plans' scenario set out in the Air Quality Report represents an 'in-combination' scenario i.e. WLP in combination with other plans and projects.

[124] The 'with plans' scenario includes background contributions and also contributions from other road sources in a future scenario (i.e. including the Future Base).

[125] Lansdown RV & Wade PM (2003). Ecology of the Floating Water-plantain, *Luronium natans*. Conserving Natura 2000 Rivers Ecology Series No. 9. English Nature, Peterborough. Available at: https://publications.naturalengland.org.uk/file/111042 [Date Accessed: 26/06/24].

[126] Lansdown RV & Wade PM (2003). Ecology of the Floating Water-plantain, *Luronium natans*. Conserving Natura 2000 Rivers Ecology Series No. 9. English Nature, Peterborough. Available at: https://publications.naturalengland.org.uk/file/111042 [Accessed: 26/06/24].

5.3.12 The Cannock Extension Canal is navigable and subject to management including dredging activities. Natural England's publication on Floating Water-plantain suggest that light boat traffic and management may supress competition from other more dominant plants and therefore work in favour of Floating Water-plantain[127]. In addition, the principal threat in Britain to Floating Water-plantain is from the restoration of waterways and the expansion of recreational boating activities[128].

5.3.13 Given the maximum ammonia level adjacent to the A5 and on the boundary of the SAC designation is equal to the critical level, with levels beyond the A5 below the critical load, taking into consideration the type of Floating Water-plantain at the SAC which is less sensitive to atmospheric inputs of ammonia, and the importance of other factors in maintenance of its conservation status, it is considered that ammonia is unlikely to have an AIOSI at the SAC as a consequence of WLP proposals in-combination with other plans.

Nitrogen Deposition

5.3.14 Nitrogen deposition rates are habitat specific as different habitats have different tolerances to different levels. As set out in **paragraph 5.3.5**, the upper critical load range has been applied to the SAC of 10 kgN/ha/yr for 'permanent oligotrophic waters: softwater lakes' which comprises the habitat type which supports the qualifying feature of the SAC.

5.3.15 The Air Quality Report (Figure 6.2, **Appendix C**) provides modelled results for nitrogen deposition at each road link for the in-combination (with plans) scenario.

5.3.16 The air quality modelling indicates that both the future baseline and also the in-combination 'with plans' scenario will result in an exceedance of the upper critical level for nitrogen deposition of 10 kgN/ha/yr across the whole SAC. Therefore, any change in the chemical composition of water within the Cannock Extension Canal SAC has the potential to allow other, more nitrogen tolerant plants, to dominate and out compete Floating Water-plantain[129].

5.3.17 A maximum total annual nitrogen deposition rate for the 'with plans' or 'in-combination' scenario is provided in the Air Quality Report in Table 11 (**Appendix C**) of 22.3 kgN/ha/yr. This includes background nitrogen deposition levels across the SAC and future contributions from other road sources. A total of 22.3 kgN/ha/yr represents a maximum change of 0.8 kgN/ha/yr from future baseline levels (which are predicted to be 21.5 kgN/ha/yr in 2042).

[127] Natural England (2018) Conservation Objectives Supplementary Advice Cannock Extension Canal SAC. Available at: https://designatedsites.naturalengland.org.uk/TerrestrialAdvicePDFs/UK0012672.pdf [Accessed 27/08/24].

[128] Lansdown RV & Wade PM (2003). Ecology of the Floating Water-plantain, *Luronium natans*. Conserving Natura 2000 Rivers Ecology Series No. 9. English Nature, Peterborough. Available at: https://publications.naturalengland.org.uk/file/111042 [Accessed: 26/06/24].

[129] Lansdown RV & Wade PM (2003). Ecology of the Floating Water-plantain, *Luronium natans*. Conserving Natura 2000 Rivers Ecology Series No. 9. English Nature, Peterborough. Available at: https://publications.naturalengland.org.uk/file/111042 [Date Accessed: 26/06/24].

5.3.18 As set out in **paragraph 3.4.7,** it is widely accepted that air quality impacts are greatest within 200m of a road source, decreasing with distance. The air quality modelling results illustrate that receptors where nitrogen deposition levels are at their greatest, above 20 kgN/ha/yr, are focused in a small area where the B4154 crosses the Canal and at the furthest northern point of the SAC where it runs close to the A5. Concentrations decrease rapidly from both road links and are below 18.5 kgN/ha/yr within 70m of the A5 and 15m of the B4154. The lowest maximum total nitrogen deposition concentration across the SAC is 15.4 kgN/ya/yr which remains 5.4 kgN/ha/yr over the critical load.

5.3.19 The maximum total road contribution to annual nitrogen deposition across the SAC is shown in the modelling to be 6.8 kgN/ha/yr. This level does not include background contributions to nitrogen deposition but does include future baseline road sources. The maximum worsening from the local plans alone is 0.8 kgN/ha/yr. The relative contribution from the road links modelled in a 'with plans' scenario decreases as distance from road source increases. Levels are greatest closest to the modelled road links (A5 and B4154) but reduce as distance from each road link increases. Levels reduce to under 2 kgN/ha/yr within less than 90m from the A5 and less than 40m from the B4154. The contribution from road sources alone in a 'with plans' scenario within the southern area of the SAC are below 0.2kgN/ha/yrkgN/ha/yr.

5.3.20 This data suggests that background levels provide a large contribution to exceedances of the nitrogen critical load across the SAC.

5.3.21 As set out in **paragraph 5.3.13**, Floating Water-plantain appears to have a very wide range of chemical and substrate tolerances. The submerged phenotype found within the SAC is also shown to be less sensitive to the atmospheric deposition of nutrients.

5.3.22 The upper critical load range (10 kg/N/ha/yr) applies if the qualifying feature (Floating Water-plantain) are associated with soft-water oligotrophic lakes. APIS notes that this critical load should only be applied to oligotrophic waters with low alkalinity with no significant agricultural or other human inputs. The Conservation Advice for the SAC indicates that there are a number of drains which feed into the canal from adjacent land, including one from Wyrley Common, which contains colliery shale waste in the water. To the north of the canal, land-uses include a restored (and sealed) refuse tip, boatyard and moorings on the offside and woodland, fishing pool and arable agriculture on the tow-path side up to the A5 trunk road[130].

5.3.23 Canals are artificial waterbodies which were constructed for navigation and comprise lentic (slow moving) systems. The Cannock Extension Canal forms part of the Birmingham Canal Navigation network, comprising an extension off the Wyrley and Essington Canal. It is therefore unlikely that the Cannock Extension Canal SAC represents an environment with no human inputs. Canals are typically representative of eutrophic standing waterbodies. Their connectivity with the surrounding landscape and drainage systems governs nutrient levels.

[130] Natural England (2018). European Site Conservation Objectives: Supplementary advice on conserving and restoring site features Cannock Extension Canal Special Area of Conservation (SAC) Site Code: UK0012672.

5.3.24 Deposition of nitrogen from the atmosphere is also unlikely to be the most significant source of nutrient inputs to eutrophic standing waters such as canals when compared to other sources of nitrogen. These other sources may include agricultural run-off, discharge from wastewater treatment works, industry and surface water run-off. Therefore, in general, atmospheric nitrogen deposition is unlikely to be harmful to eutrophic standing waters[131]. Data presented on APIS indicates that phosphorous is likely to be more important than nitrogen in terms of algal growth and nutrient enrichment in standing waterbodies such as canals.

5.3.25 Natural England's publication indicates that light boat traffic and management may supress competition from other more dominant plants and therefore work in favour of Floating Water-plantain[132].

5.3.26 Given the broad tolerance of Floating Water-plantain to a range of nutrient environments, the submerged phenotype present at the SAC which is less sensitive to atmospheric nutrient inputs and likely existing and historical human inputs to the canal, it can be concluded that there will be no in-combination AIOSI at the SAC in relation to reduced air quality caused by the WLP in combination. The SAC targets in respect of air quality to 'restore concentrations and deposition of air pollutants to at or below the site-relevant Critical Load or Level values given for this feature of the site on the APIS' will not be compromised as a result of the WLP alone or when considered in-combination.

5.4 Fens Pool SAC air quality Appropriate Assessment

5.4.1 Fens Pools SAC is located within Dudley, approximately 4.8km to the south of the Plan area. The qualifying feature of Fens Pools SAC is the Great Crested Newts (GCN, *Triturus cristatus*)[133]. As set out in Natural England's Supplementary Advice[134], the GCN is sensitive to air pollution. Natural England indicates that a change in air quality has the potential to 'modify the chemical status of its substrate, accelerating or damaging plant growth, altering its vegetation structure and composition (including food-plants) and reducing supporting habitat quality and population viability of this feature'. The management target for this habitat in terms of air quality is to 'maintain concentrations and deposition of air pollutants at or below the site-relevant Critical Load or Level values given for GCN supporting habitats on the Air Pollution Information System'. Therefore, any further deterioration of air quality at the SAC as a result of the WLP either alone or in-combination with other plans and projects has the potential to have adverse impacts on the integrity of the SAC.

[131] APIS Nitrogen Deposition: Standing Open Water and Canals. Available at: https://www.apis.ac.uk/node/983 [Date Accessed: 08/08/24].

[132] Natural England (2018) Conservation Objectives Supplementary Advice Cannock Extension Canal SAC. Available at: https://designatedsites.naturalengland.org.uk/TerrestrialAdvicePDFs/UK0012672.pdf [Accessed 27/08/24].

[133] Natural England. (2018) Fens Pools SAC Conservation Objectives. Available at: https://publications.naturalengland.org.uk/publication/5327609814581248 [Accessed: 04/06/24].

[134] Natural England. (2019) Fens Pools SAC. Supplementary Advice on Conservation Objectives. Available at: https://designatedsites.naturalengland.org.uk/SiteGeneralDetail.aspx?SiteCode=UK0030150&SiteName=fens%20pools&countyCode=&responsiblePerson=&SeaArea=&IFCAArea= [Accessed: 04/06/24].

5.4.2 Fens Pools SAC is underpinned by Fens Pool SSSI which is split into six SSSI units, all of which are in a favourable condition[135].

5.4.3 No critical loads or levels are provided on APIS for GCNs as the decision on such levels is to be taken at a site-specific level because habitat sensitivity is likely to be phosphorus rather than nitrogen limited. As such the air quality modelling has used critical loads and levels for permanent oligotrophic waters (soft water lakes) as a proxy. These are presented in Table 7 of the Air Quality Report (**Appendix C**) and summarised in **Table 5.4**. It is acknowledged that the critical load range for nitrogen deposition at the SAC (for permanent oligotrophic lakes, ponds and pools (including softwater lakes)) is 2-10kgN/ha/yr. As noted on APIS, the lower end of this range is intended for boreal and alpine lakes and therefore the upper end of the range has been applied in this AA as it is more appropriate as it applies to Atlantic softwaters.

Table 5.4: Critical Loads and Levels at Fens Pools SAC assessed in the Air Quality Report (**Appendix C**)

European site	Qualifying habitat or habitat upon which qualifying species relies	NOx Annual Critical Level (µg/m^3)	NH_3 Annual Mean Critical Level (µg/m^3)	N Deposition Critical Load (kg N/ha/yr)
Fens Pools SAC	Permanent oligotrophic waters: Softwater lakes	30	3	10[136]

5.4.4 The background (2022) and future (2042) NOx and NH_3 concentrations are below the annual mean critical levels at Fens Pools SAC[137] (Table 4.2 of **Appendix C**). Background nitrogen deposition rates in both the baseline and future years are projected to exceed the respective lower critical loads at the SAC. Levels in 2022 are 16.6–17.0 kgN/ha/yr at Fens Pools SAC reducing in 2042 to 14.9-15.2 kgN/ha/yr[138].

5.4.5 Two road links within 200m of Fens Pools SAC were included in the air quality modelling as they exceeded the 1,000 AADT screening threshold (see **Section 3.4**). These include the A4101 High Street (RAP 12) and A461 (RAP 13) as illustrated in **Figure 5.2**.

[135] Natural England. SSSI Condition Summary: Fens Pools SSSI. Available at: https://designatedsites.naturalengland.org.uk/SiteUnitList.aspx?SiteCode=S1003757&SiteName=fens%20pools&countyCode=&responsiblePerson=&unitId=&SeaArea=&IFCAArea= [Accessed: 19/06/24].

[136] Note: as set out on APIS the upper range of the nitrogen critical load for the SAC has been applied in this assessment as the lower end of the range (2kg/N/ha/yr) applies only to boreal and alpine lakes.

[137] Sweco (2024) Assessment of Air Quality Impacts on European Sites in Staffordshire, Wolverhampton, Walsall, Sandwell and Dudley.

[138] Sweco (2024) Assessment of Air Quality Impacts on European Sites in Staffordshire, Wolverhampton, Walsall, Sandwell and Dudley.

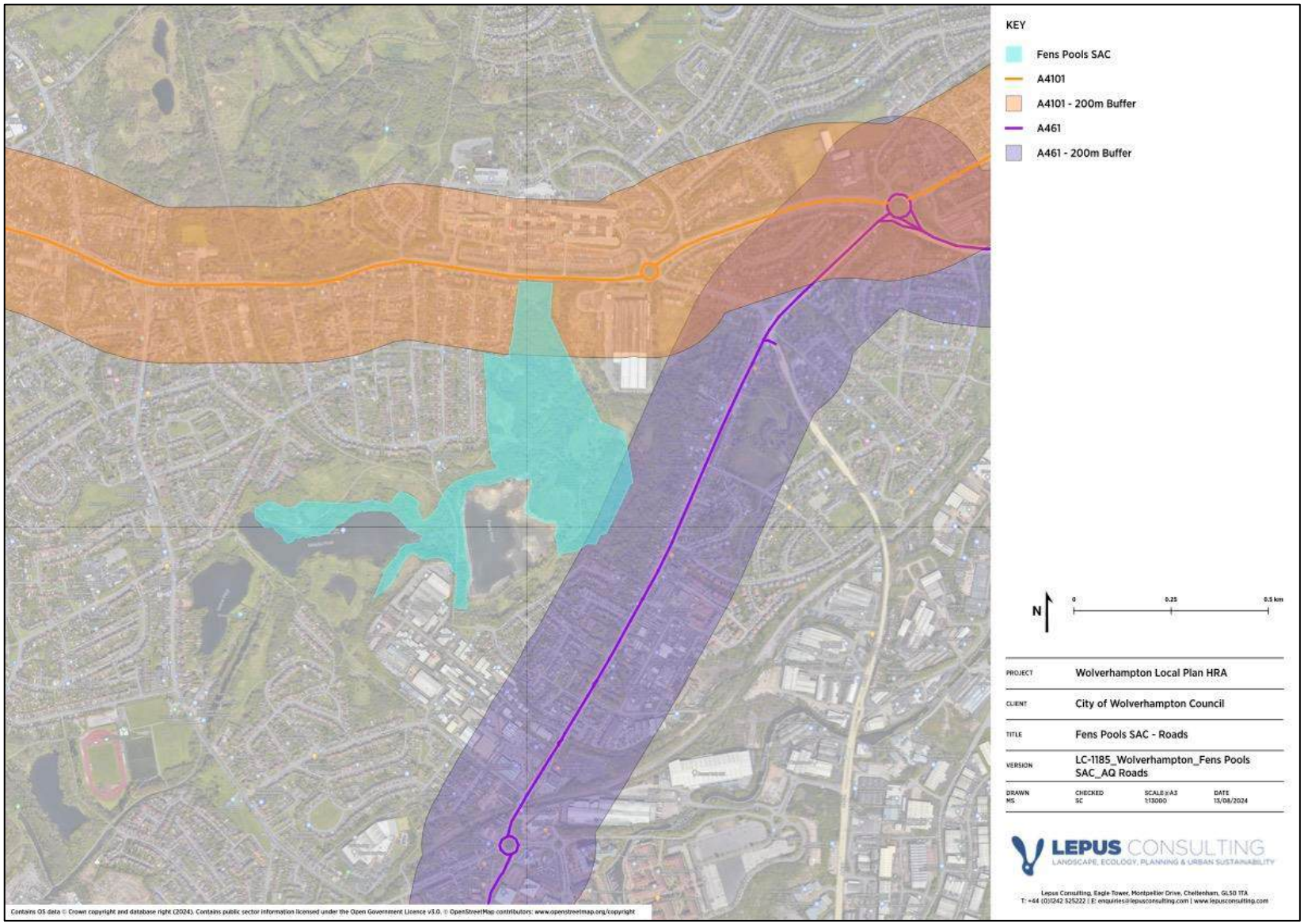

Figure 5.3: *Roads within 200m of Fens Pools SAC considered in the HRA process*

Appropriate Assessment

Nitrogen Oxides

5.4.6 The air quality modelling indicates that the maximum modelled annual mean concentration in the 'with plans' scenario (26.3 μg/m^3) remains below the critical level for NOx (30 μg/m^3). Given there will be no exceedance of the NOx crucial level, direct toxicity is not likely to have an AIOSI on the SAC. However, it is necessary to consider the contribution of NOx to nitrogen deposition further through the AA. This will allow a habitat specific assessment of potential impacts associated with emissions.

Ammonia

5.4.7 The Air Quality Report indicates that the maximum modelled annual mean concentration in the 'with plan' scenario (3 μg/m^3), was exceeded at four receptor points all of which are located immediately adjacent to the A4101 on the boundary of the SAC. The level at these points is marginally above the critical level (3.3 μg/m^3). Modelled data for all other receptors across the SAC are below the critical level.

5.4.8 Modelled background forecast data suggests that levels are due to rise slightly between 2022 (1.8 μg/m^3) and 2042 (1.8 to 1.9 μg/m^3), Table 6, **Appendix C**.

5.4.9 As set out in **Section 5.3**, Fens Pools SAC is designated for GCN which rely on water bodies to breed during the aquatic stages of their life cycle. They are known to travel approximately 500m from their breeding pond habitat during the terrestrial phase of their lifecycle depending on resource availability[139] and forage, disperse and rest on land.

5.4.10 A total of 1.97ha of the SAC is located within 200m of the A4101 and a total of 0.87ha of the SAC is located within 200m of the A461. This represents 9.6% and 4.3% of the total area of Fens Pools SAC respectively. Fens Pools SAC is predominantly in the ownership of Dudley Council and the CRT, with smaller areas owned by private landowners. Consultation with Dudley Council Countryside Services Team indicates that recent GCN surveys show that the closest GCN breeding pond to the A4101 is located over 300m to its south[140]. As set out in **paragraph 3.4.7**, it is widely accepted that air quality impacts are greatest within 200m of a road source, decreasing with distance.

5.4.11 The main ponds (Fens Pool, Middle Pool, Grove Pool and Wide Waters) do not support GCN, due in part to the presence of large populations of carp. Recent GCN surveys undertaken in 2024 which were shared with Dudley Council Countryside Management Team, indicate that the smaller GCN breeding ponds are in a good condition with newts recorded at each.

[139] Langton, T.E.S.; Beckett, C. L.; Foster, J. P. (2001) Great Crested Newt Conservation Handbook, Froglife, Halesworth. Available at: https://www.froglife.org/wp-content/uploads/2013/06/GCN-Conservation-Handbook_compressed.pdf [Accessed 05/07/24].

[140] Pers Cons 19th June 2024. Dudley Council Countryside Management Team.

5.4.12 The nearest GCN breeding pond to the A4101 is beyond the 200m buffer over which a change in air quality is likely to have an adverse effect from each road link (over 300m to the south of the A4101[141]). The closest GCN breeding pond to the A461 is located approximately 150m to its west. Potential terrestrial habitat is however located within 200m of both the A4101 and A461.

5.4.13 Natural England's SIP[142] and consultation with Dudley Council Countryside Management Team indicates that anti-social behaviours, such as use of off-road vehicles, unlicensed grazing, use of larger ponds by anglers, campfires, night fishing, the presence of non-native alpine newts and fragmentation of GCN habitat are a particular risk to GCN populations at the site.

5.4.14 Dudley Council is working on the creation of a GCN corridor to connect the landscape and provide connectivity between Fens Pools SAC and Barrow Hill SSSI, on to Aldersley Sports Village in Wolverhampton and finally Bagridge Country Park in South Staffordshire. Dudley Council is currently carrying out GCN enhancement work at Barrow Hill SSSI.

5.4.15 The maximum modelled annual ammonia mean concentration in the 'with plan' scenario (3 $\mu g/m^3$), was exceeded at only six receptor points all of which are located immediately adjacent to the A4101 on the boundary of the SAC, and which are not coincident with the GCN breeding ponds. Modelled data for all other receptors across the SAC shows concentrations are below the critical level. Taking this into consideration, alongside the location of GCN breeding ponds from the A4101 (more than 300m), the favourable condition status of the SSSI and positive measures in place by Dudley Council to enhance and extend GCN habitat within the wider landscape (**paragraph 5.6.9**) it can be concluded that there will be no AIOSI from an increase in ammonia.

5.4.16 Whilst the critical level is not exceeded for the WLP in-combination, with the exception of six receptor points on the edge of the A4101, it is necessary to consider the contribution of ammonia to nitrogen deposition further through the AA. This will allow a habitat specific assessment of potential impacts associated with emissions.

Nitrogen Deposition

5.4.17 Nitrogen deposition rates are habitat specific as different habitats have different tolerances to different levels. The upper critical load range of 10 kgN/ha/yr has been applied in the air quality modelling for 'permanent oligotrophic waters: soft-water lakes' which comprises the habitat type which supports the SAC's qualifying feature: GCNs.

5.4.18 The Air Quality Report (**Appendix C**) provides modelled results for nitrogen deposition within 200m of each road link (A4101 High Street and A461 Stourbridge Road) for the in-combination (with plans) scenario. The air quality modelling indicates that both the future baseline and also the in-combination 'with plans' scenario will result in an exceedance of the upper critical load for nitrogen deposition of 10 kgN/ha/yr across the whole SAC.

[141] Pers Cons 19th June 2024. Dudley Council Countryside Management Team.

[142] Natural England (2014) Site Improvement Plan: Fens Pool. Available at: https://publications.naturalengland.org.uk/publication/6307825315741696 [Accessed 19/06/24]

5.4.19 A review of background air quality trends provided on APIS[143] indicates that there has been a decrease in the average level of nitrogen deposition at Fens Pools SAC between 2003 (15.67 kgN/ha/yr) and 2021 (10.83 kgN/ha/yr) of 4.84 kgN/ha/yr. Table 6 of the Air Quality Report (**Appendix C**) indicates that nitrogen deposition is forecast to reduce from 2022 (16.6-17.0 kgN/ha/yr) to 2024 (14.9-15.2 kgN/ha/yr).

5.4.20 A maximum total concentration for the 'with plans' or 'in-combination' scenario is provided in the Air Quality Report in Table 11 (**Appendix C**) of 22.8 kgN/ha/yr. This includes background nitrogen deposition levels across the SAC and future base road contributions. This represents a change from baseline levels of 0.8 kgN/ha/yr (which is predicted to be 22.0 kgN/ha/yr in 2042).

5.4.21 As set out in **paragraph 3.4.7,** it is widely accepted that air quality impacts are greatest within 200m of a road source, decreasing with distance. The air quality modelling results illustrate that receptors where nitrogen deposition levels are at their greatest, above 20 kgN/ha/yr, are focused in a small area within 15m of the A4101 High Street. These levels include a combination of both background concentrations along with contributions from a 'with plans' scenario. Nitrogen deposition concentrations decrease rapidly from this road link and are below 17 kgN/ha/yr within 70m of the A4101. Levels within 200m of the A416 Sherboune Road range between 15.8–16 kgN/ha/yr where the SAC designation begins (approximately 157m to the west of the A416). The lowest maximum nitrogen deposition concentration across the SAC is 15.4 kgN/ya/yr which remains over the upper critical load of 10 kgN/ha/yr.

5.4.22 The maximum total road contribution to annual nitrogen deposition across the modelled area is shown to be 0.8 kgN/ha/yr which includes areas close to the B4179 which are outside the SAC designated boundary. This level does not include background contributions to nitrogen deposition but does include future base road contributions not attributed to a 'with plans' scenario. The relative contribution from the road links modelled in a 'with plans' scenario decreases as distance from road source increases. Levels are greatest closest to the A4101 High Street, with a maximum level of 7 kgN/ha/yr, but reduce as distance from the A4101 increases. Levels reduce to under 2 kgN/ha/yr within less than 50m of the A4101. Maximum levels within 200m of the A416 Sherboune Road are below 0.8 kgN/ha/y (at 156m from the road link where the SAC designation boundary begins) and continue to decrease into the SAC. The contribution from road sources alone in a 'with plans' scenario within the southern area of the SAC are below 0.4 kgN/ha/yr.

5.4.23 This data suggests that background levels provide a large contribution to exceedances of the nitrogen critical load across the SAC with a maximum worsening from the plans in combination of 0.8 kgN/ha/yr.

[143] APIS. Available at: https://www.apis.ac.uk/srcl [Accessed: 07/08/24].

5.4.24 The highest levels of nitrogen deposition are located to the south of the SAC (outside the designated boundary) immediately adjacent to the B4179. The highest maximum nitrogen deposition level in the 'with plans' scenario within the SAC designation boundary is located on the SAC boundary within 20m of the A4101 High Street (see Figure 6.3 of **Appendix C**). Areas where the 1% screening threshold is exceeded do not coincide with any GCN breeding pond. In addition, GCN surveys undertaken in 2024 indicate that GCN breeding ponds are in a good condition with newts recorded at each.

5.4.25 The upper critical load of 10 kg/N/ha/yr applies where the qualifying feature (GCN) is associated with soft-water oligotrophic lakes. APIS notes that this critical load should only be applied to oligotrophic waters with low alkalinity with no significant agricultural or other human inputs. The Conservation Advice for the SAC indicates that the site is vulnerable to runoff that drains into it from the surrounding residential areas and industrial estate. There are known discharges from adjacent industrial areas into GCN breeding ponds and Natural England's Conservation Advice notes that many of the ponds are naturally eutrophic and base-rich from the local clay geology. This attribute concerns point source, anthropogenic pollution resulting from discharges onto the site or dumping adjacent to ponds[144]. It is unlikely that soft water oligotrophic lakes are representative of the Fens Pools SAC, as these ponds are typically representative of eutrophic standing waterbodies. As with the Cannock Extension Canal SAC, data provided on APIS indicates that deposition of nitrogen from the atmosphere is unlikely to be the largest source of nutrients to eutrophic standing waters and, therefore, in general, nitrogen deposition is unlikely to be harmful to eutrophic standing waters, even when close to sources[145]. Data on APIS also notes that phosphorous is likely to be more important than nitrogen in terms of algal growth and nutrient enrichment in standing waterbodies.

5.4.26 As noted in **paragraph 5.4.12**, the GCN breeding ponds at Fens Pools SAC are in a good condition and issues associated with anti-social behaviour are the key conservational concern at the SAC. In addition, as noted in **paragraph 5.4.15**, that Dudley Council is progressing enhancement work to enhance and extent GCN habitat within the wider landscape which will have a positive impact upon populations.

5.4.27 Given the small in-combination contribution of nitrogen deposition levels (0.8 kgN/ha/yr within SAC boundary) when compared to background levels, areas of exceedance do not coincide with GCN breeding ponds, the reduction in 'with plans' contributions across the SAC as distance from road link increases and the good status of GCN populations at the SAC it can be concluded that there will be no in-combination AIOSI at the SAC in relation to reduced air quality caused by the WLP in combination. The SAC targets in respect of air quality to "restore concentrations and deposition of air pollutants to at or below the site-relevant Critical Load or Level values given for this feature of the site on the APIS" will not be compromised as a result of the WLP alone or when considered in-combination.

[144] Natural England (2017). European Site Conservation Objectives: Supplementary advice on conserving and restoring site features Fens Pools Special Area of Conservation (SAC) Site Code: UK0030150.

[145] APIS Nitrogen Deposition: Standing Open Water and Canals. Available at: https://www.apis.ac.uk/node/983 [Date Accessed: 08/08/24].

5.5 Positive policy wording

5.5.1 Whilst no AIOSI have been concluded through the AA (**Sections 5.2** to **5.4**) and mitigation is not required to address any adverse air quality impacts on any European site, it is noted that policies set out in the WLP will have a positive impact on local air quality. These include those policies that incorporate measures for sustainable transport and a requirement to encourage a modal shift and promote active transport options (see **Table 5.5**). These measures will discourage the use of the private car and encourage use of electric vehicles (EVs).

Table 5.5: WLP policies with positive effects on air quality

Policy Number	Policy Name	How does the policy mitigate air quality LSEs?
Policy CSP1	Spatial Strategy	This policy outlines the provision of 'excellent' public transport links in Wolverhampton City Centre, the Core Regeneration Areas and the Neighbourhood Areas and Green Belt.
Policy CSP2	Placemaking: Achieving Well Designed Places	This policy outlines that new development should promote maximum freedom of choice through sustainable means of transport.
Policy HW3	Healthcare Facilities	The policy requires new healthcare facilities to be well-served by public transport, walking and cycling infrastructure.
Policy HOU6	Education Facilities	This policy requires new education facilities to be well-served by public transport, walking and cycling infrastructure.
Policy EMP5	Improving Access to the Labour Market	This policy requires employment development to enhance accessibility to residents through walking, cycling and public transport.
Policy CEN2	Wolverhampton's Centres	This policy promotes the use of sustainable modes of transport in the Growth Network.
Policy CEN3	Provision of Local Facilities	This policy requires local facilities to be within a convenient, safe, walking distance of the community.
Policy CEN4	Edge-of-Centre and Out-of-Centre Development	This policy requires edge-of-centre and out-of-centre developments to be well integrated with public transport, walking and cycling.
Policy TRAN1	Priorities for the Development of the Transport Networks	This policy requires all new developments to provide adequate access for all modes of travel.
Policy TRAN4	The Efficient Movement of Freight	This policy encourages the movement of freight by sustainable modes of transport, including rail and waterways.
Policy TRAN5	Creating Coherent Networks for Cycling and for Walking	This policy encourages sustainable travel and requires developments to link walking and cycling networks.
Policy TRAN6	Influencing the Demand for Travel and Travel Choices	This policy sets out Smarter Choice measures to reduce the need to travel and encourage the use of sustainable modes of transport.
Policy TRAN8	Planning for Low Emission Vehicles	This policy promotes the use of low emission vehicles (LEVs).
Policy ENV7	Canal Network	This policy encourages the use of the canal network for non-car based modes of transport.
Policy ENV8	Open Space and Recreation	This policy promotes the provision of footpaths and cycle networks in open spaces.

Policy Number	Policy Name	How does the policy mitigate air quality LSEs?
Policy ENV9	Playing Fields and Sports Facilities	This policy requires new sports facilities to be well-served by public transport, walking and cycling infrastructure.
Policy ENV11	Air Quality	This policy sets out measures that prevent the deterioration of air quality of aerial deposition / emissions which could cause harm to sensitive habitats or species at designated sites (Box 1). Justification text also sets out the types of development which may result in poor air quality at habitats and for species, and notes the requirement for development to take into consideration Natural England's guidance on assessing the implications of road traffic on European sites. This policy also requires the integration of cycling, walking, public transport and electric charging points and promotes modal shift.

Box 1: Extract from Policy ENV11 – Air Quality

1. All new developments must be at least air quality neutral following any required mitigation. Planning permission for new development or change of use will be refused where data assessment indicates that development will:

- a) lead to deterioration of existing poor air quality;
- b) lead to a deterioration of air quality or aerial deposition / emissions which could cause harm to sensitive habitats or species at designated sites;
- c) create any new areas that exceed air quality objectives; or,
- d) delay compliance being achieved in areas that are currently in exceedance of legal limits unless sufficient mitigation can be achieved.

5.5.2 In addition, the West Midlands Local Transport Plan[146] (LTP) aims to promote a safe, integrated, efficient and economic transport system and outlines a vision for improving accessibility, reducing traffic and electrifying transport. The LTP focuses on an emission free transport system alongside encouraging a behavioural change towards active travel including public transport, walking and cycling. There are also a number of national initiatives to reduce vehicle related emissions, such as the Starmer's Labour Government commitment to restore the phase out of new petrol and diesel vehicles by 2030[147].

5.5.3 Acting together, the WLP policies, county and national led initiatives will promote sustainable transport options with reductions in reliance on the private car and associated reductions in traffic emissions having a positive influence on air quality.

[146] West Midlands Combined Authority. 2016. West Midlands Strategic Transport Plan. Available at: at https://www.tfwm.org.uk/who-we-are/our-strategy/local-transport-plan/ [Date Accessed: 19/06/24].

[147] Labour (2024) Driving a Growing Economy Labour's Plan for the Automative Sector. Available at: https://labour.org.uk/wp-content/uploads/2023/10/WR-797_23-Automotive-strategy-v8.pdf [Accessed 13/08/24].

6 Water Quality and Water Quantity Appropriate Assessment

6.1 Introduction

6.1.1 The HRA screening process in **Chapter 4** concluded that a number of WLP policies and all allocations have the potential to result in likely significant hydrological impacts at the following European sites:

- Cannock Chase SAC
- Cannock Extension Canal SAC
- Fens Pools SAC
- Humber Estuary SAC
- Humber Estuary Ramsar
- Midland Meres & Mosses Phase 1 Ramsar
- Midland Meres & Mosses Phase 2 Ramsar
- Mottey Meadows SAC
- Severn Estuary SAC
- Severn Estuary Ramsar

6.1.2 This chapter provides an AA which assesses more precisely the ecological impacts associated with a deterioration in water quality and changes to water quantity due to WLP growth at each European site in view of its qualifying features and conservation objectives.

6.1.3 The following policies were screened into the HRA process for consideration in an AA due to water LSEs (**Appendix D**):

- Policy CSP1 – Spatial Strategy
- Policy HOU1 – Delivering Sustainable Housing Growth
- Policy HOU5 – Accommodation for Gypsies and Travellers and Travelling Showpeople
- Policy EMP1 – Providing for Economic Growth and Jobs
- Policy EMP2 – Strategic Employment Areas
- Policy EMP3 – Local Employment Areas
- Policy EMP4 – Other Employment Sites
- Policy CEN2 – Wolverhampton's Centres
- Policy W3 – Locational Requirements for New Waste Management Facilities

6.2 Water quality Appropriate Assessment

Introduction

6.2.1 As noted in **Section 3.5**, development has the potential to reduce the quality of water entering a catchment through processes such as sedimentation, accidental spillage of chemicals and materials and operational surface water runoff. Water quality may also be reduced through effluent discharges at STWs. This change in water quality can increase nutrient inputs into a catchment which can lead to algal blooms, reduce dissolved oxygen and increased turbidity. This can affect the overall condition of the receiving waterbody and may have adverse effects at hydrologically sensitive and connected European sites and their qualifying features.

6.2.2 Together the Government, the EA and the water companies are responsible for preparing plans and strategies and implementing a regulatory framework to ensure there is enough water for the future needs of both people and the environment and manage the treatment of wastewater. This is undertaken through a catchment-based approach and provides protection for European sites and ensures compliance with the WFD[148].

6.2.3 The WFD provides an indication of the health of the water environment and whether a water body is at good status or potential. This is determined through an assessment of a range of elements relating to the biology and chemical quality of surface waters and quantitative and chemical quality of groundwater. To achieve a good ecological status or potential, good chemical status or good groundwater status every single element assessed must be at a good status or better. If one element is below its threshold for good status, then the whole water body's status is classed below good. Surface water bodies can be classed as high, good, moderate, poor or bad status.

6.2.4 The scoping assessment (presented in **Chapter 3**) identified water quality LSEs at the following six European sites:

- Cannock Extension Canal SAC
- Fens Pools SAC
- Humber Estuary SAC
- Humber Estuary Ramsar
- Severn Estuary SAC
- Severn Estuary Ramsar

[148] https://environment.ec.europa.eu/topics/water/water-framework-directive_en.

Mitigation

6.2.5 Policy ENV12 (Flood Risk and Water Quality) aims to reduce poor quality surface run-off and groundwater as a result of flood events. The policy requires development in areas of flood risk to conduct a flood risk assessment and surface water drainage strategy and protects water quality (see **Box 2**).

Box 2: Extract from Policy ENV12 – Flood Risk and Water Quality

1. The Council will seek to minimise the probability and consequences of flooding from all sources by adopting a strong risk-based approach to site allocations and the granting of planning permission.
2. All development proposals in any of the following locations must be accompanied by a flood risk assessment and surface water drainage strategy that sets out how the development will provide a wider betterment in flood risk terms.
3. All development should be designed to protect and enhance water quality, in particular to help deliver the relevant River Basin Management Plan measures and objectives for Water Framework Directive water bodies.

6.2.6 Policy ENV13 (Sustainable Drainage Systems and Surface Water Management) requires new development to protect the quality of environment through the incorporation of Sustainable Drainage Systems (SuDS) and the reduction in surface water flows for all development. On-going dialogue will also be required with Severn Trent Water to ensure adequate STW infrastructure is in place to accommodate future forecast growth and ensure WFD targets for 'Good Ecological Status' are maintained. In addition, Policy W4 (Locational Considerations for New Waste Facilities) and Policy MIN4 (Managing the Effects of Mineral Development) ensures waste management facilities and mineral development will not harm water quality.

6.2.7 Policy CSP2 (Placemaking: Achieving Well Designed Places) protects and enhances Wolverhampton's canal network and natural waterways, including Cannock Extension Canal SAC. Policy ENV7 (Canal Network) requires all development proposals likely to affect the canal network to protect and enhance the water quality in the canal. The Wyrley and Essington Canal Local Nature Reserve (LNR) management plan[149] also aims to maintain the LNR to the benefit of both biodiversity and the community.

[149] Canal & Rivers Trust (2017) Black Country Wyrley & Essington Canal Local Nature Reserve Draft Management Plan. Available at: https://www.wolverhampton.gov.uk/sites/default/files/pdf/Black_Country_Wyrley_and_Essington_Canal_LNR_Draft_Management_Plan_March_2017.pdf [Accessed 09/09/24].

Cannock Extension Canal SAC

6.2.8 As outlined in **Section 5.3**, the Cannock Extension Canal SAC, which is located approximately 5.7km to the north-east of the Plan area, is part of the extensive inland water system through the Black Country and comprises an extension off the Wyrley and Essington Canal. The Cannock Extension Canal SAC is fed by the Chasewater Reservoir, which lies approximately 8km to the north of the SAC[150]. The canal is hydrologically linked to the Wyrley and Essington Canal via the Birmingham Canal, Walsall Canal and Tame Valley Canal which extend into the Plan area[151]. The Wyrley and Essington Canal is a contour canal which means that it follows the contours of the land with no intervening locks. As set out in **Appendix B,** the SAC is designated for Floating Water-plantain. Natural England's SIP[152] for the SAC lists water pollution as a pressure at the SAC and notes that Floating Water-plantain is sensitive to changes in water quality.

6.2.9 As set out in **paragraph 5.3.24**, canals are artificial waterbodies and comprise lentic (slow moving) systems. Their connectivity with the surrounding landscape and drainage systems governs nutrient levels. Sources of water pollution may include agricultural run-off, discharge from wastewater treatment works, industry and surface water run-off.

6.2.10 Whilst water quality in the Chasewater Reservoir and its surrounding catchment is good, historically, high sediment loads into the canal have resulted in poor water quality[153]. Although the origin of the high sediment loads has been resolved, there remains a low sediment load in the inflow water in times of heavy rainfall events[154]. Consultation with the CRT[155], who are landowners at the Cannock Extension Canal SAC, indicates that numerous discharges feed into the Wyrley and Essington Canal, which could potentially impact water quality at the SAC.

[150] Natural England (2018) Cannock Extension Canal SAC Conservation Objectives Supplementary Advice. Available at: https://designatedsites.naturalengland.org.uk/TerrestrialAdvicePDFs/UK0012672.pdf [Accessed 30/08/24].

[151] Canal & Rivers Trust. Wolverhampton Local Plan: Issues and Preferred Options. Letter. 9th April 2024.

[152] Natural England (2014) Site Improvement Plan: Cannock Extension Canal. Available at: https://publications.naturalengland.org.uk/file/6749431462363136 [Accessed 13/08/24].

[153] Natural England (2018) Cannock Extension Canal SAC Conservation Objectives Supplementary Advice. Available at: https://designatedsites.naturalengland.org.uk/TerrestrialAdvicePDFs/UK0012672.pdf [Accessed 02/09/24].

[154] Natural England (2014) Site Improvement Plan: Cannock Extension Canal. Available at: https://publications.naturalengland.org.uk/file/6749431462363136 [Accessed 13/08/24].

[155] Canal & Rivers Trust. Wolverhampton Local Plan: Issues and Preferred Options. Letter. 9th April 2024.

6.2.11 In addition, and as noted in **paragraph 5.3.23,** the Conservation Advice for the SAC indicates that there are a number of drains which feed into the Canal from adjacent land, including one from Wyrley Common, which contains colliery shale waste in the water. To the north of the Canal, land uses include a restored (and sealed) refuse tip, boatyard and moorings on the offside and woodland, fishing pool and arable agriculture on the tow-path side up to the A5 trunk road[156]. Natural England identifies water pollution from agricultural sources as an issue at the SAC[157].

6.2.12 Research undertaken by Natural England indicates that Floating Water-plantain has a wide range of chemical tolerances and has been recorded in a range of waters from oligotrophic, to meso-oligotrophic and meso-eutrophic waters[158]. This body of work indicates that competition and succession are the major influences limiting the distribution and abundance of the Floating Water-plantain. Factors suppressing succession are artificial and include disturbance of sediment by light boat traffic. The use of the Cannock Extension Canal SAC by boat traffic and management through dredging may therefore be responsible for the exclusion of more competitive species. Nutrient inputs from surface water run-off however have the potential to increase the dominance of nutrient loving species and lead to succession.

6.2.13 Natural England's Supplementary Advice for the SAC indicates that the target is to 'restore' water quality to standards which will provide the necessary conditions to support Floating Water-plantain which includes total concentrations of phosphorus of less than 20μg/l. Available water quality monitoring data indicates that this objective is not being achieved[159].

[156] Natural England (2018). European Site Conservation Objectives: Supplementary advice on conserving and restoring site features Cannock Extension Canal Special Area of Conservation (SAC) Site Code: UK0012672.

[157] Natural England (2015) Designated Sites View: Cannock Extension Canal SSSI – Pressures. Available at: https://designatedsites.naturalengland.org.uk/SitePressures.aspx?SiteGuid=eeb695e3-5a50-e411-a6ba-000d3a2004ef&SiteCode=S1006558&SiteName=Cannock%20Extension%20Canal%20SSSI [Accessed 13/08/24].

[158] Lansdown RV & Wade PM (2003). Ecology of the Floating Water-plantain, *Luronium natans*. Conserving Natura 2000 Rivers Ecology Series No. 9. English Nature, Peterborough. Available at: https://publications.naturalengland.org.uk/file/111042 [Accessed: 26/06/24].

[159] Natural England (2018). European Site Conservation Objectives: Supplementary advice on conserving and restoring site features Cannock Extension Canal Special Area of Conservation (SAC) Site Code: UK0012672.

6.2.14 The outputs of the BCP WCS[160] have been drawn upon to inform this AA. The BCP WCS was undertaken through consultation with the statutory water suppliers, the EA and neighbouring LPAs. There are fourteen STW within or close to the study area that are operated by STW[161]. Of these, Barnhurst STW, Coven Heath STW and Minworth Works STW are likely to serve allocations set out in the WLP[162]. As part of the BCP WCS, Severn Trent Water provided information on each of their STWs, including an assessment of future capacity based on current water quality performance, physical constraints and details of planned upgrades. This indicated that, when considered in combination with neighbouring growth, a number of STWs had limited environmental headroom.

6.2.15 Since the WCS, Severn Trent Water was engaged to carry out a Wolverhampton Wastewater Treatment Works and Network Assessment, to address issues raised in the Black Country Phase 1 Scoping Water Cycle Study and Reg 18 representations by Environment Agency regarding water quality issues. This work has indicated that Barnhurst STW, Coven Heath STW and Minworth Works STW have low or medium capacity. STW also noted that proposed growth in the Barnhurst catchment form the WLP is likely to be accommodated within the current treatment capacity of the works to the end of Asset Management Period 8 (AMP8, 2025 to 2030), subject to growth information/assumptions for other LPAs served by Barnhurst STW remaining valid.

6.2.16 Increased growth can lead to a deterioration of water quality at water sensitive European sites through either polluted surface water run off or through increased discharges from STWs. Under the WFD, a watercourse is not allowed to deteriorate from its current WFD classification (either as an overall watercourse or for individual elements assessed). Consultation with SWT indicates that water quality will be addressed in the WRMP[163].

6.2.17 Effluent discharge to the water environment is controlled through an environmental permitting system which is administered by the EA. The level of discharge is determined by the EA through the issue of Environmental Permits (EPs). These ensure the receiving watercourse is not prevented from meeting its environmental objectives under the WFD, with specific regard to the physico-chemical status element of the WFD classification.

6.2.18 Natural England note that the principal threat in Britain to Floating water-plantain is now from the restoration of waterways and the expansion of recreational boating activities[164].

6.2.19 Polices set out in **paragraphs 6.2.5** to **6.2.7** will ensure water discharges from new development set out in the WLP are managed to ensure no deterioration in water quality from surface water run-off.

[160] JBA Consulting (2020) Black Country Councils Water Cycle Study: Phase 1 Scoping Study. Available at: https://blackcountryplan.dudley.gov.uk/media/17930/wcs-evidence-base-summary_.pdf [Accessed 13/09/24].

[161] JBA Consulting (2020) Black Country Councils Water Cycle Study: Phase 1 Scoping Study. Available at: https://blackcountryplan.dudley.gov.uk/media/17930/wcs-evidence-base-summary_.pdf [Accessed 13/09/24].

[162] Severn Trent. Wolverhampton Wastewater Treatment Works Assessment. Letter. 25th September 2024

[163] Severn Trent. Wolverhampton Wastewater Treatment Works Assessment. Letter. 25th September 2024

[164] Lansdown RV & Wade PM (2003). Ecology of the Floating Water-plantain, *Luronium natans*. Conserving Natura 2000 Rivers Ecology Series No. 9. English Nature, Peterborough. Available at: https://publications.naturalengland.org.uk/file/111042 [Accessed: 26/06/24].

6.2.20 Taking into consideration the protection that WLP policies give to water quality, outputs of consultation with Severn Trent Water and the location of allocations in relation to the SAC (more than 8km to the south west), it can be concluded that there will be no AIOSI as a result of the WLP either alone or in-combination on the Cannock Extension Canal SAC.

Fens Pools SAC

6.2.21 Fens Pools SAC is located approximately 4.8km to the south of the Plan area and comprises a series of small pools as well as swamp, fen and inundation communities to unimproved neutral and acidic grassland and scrub[165]. As set out at **Appendix B**, the qualifying species of the SAC is GCN.

6.2.22 Water is supplied to Fens Pools SAC from rainfall, run-off from neighbouring residential areas and inputs from springs to the northeastern corner of the site[166]. A review of topographical mapping data and consultation with the CRT[167] indicates that the ground levels are elevated between Fens Pools SAC and the WLP boundary several intervening upslope lock fights.

6.2.23 The closest watercourse to the SAC is the Stourbridge Canal which is located approximately 150m to its south. The main ponds at Fens Pools SAC (Fens Pool, Middle Pool, Grove Pool and Wide Water) connect to the Stourbridge Canal.

6.2.24 As set out in **paragraph 5.4.12**, consultation with the Dudley Council Countryside Services Team indicates that the main ponds (Fens Pool, Middle Pool, Grove Pool and Wide Waters) do not support GCN, due in part to the presence of large populations of carp. Recent GCN surveys undertaken in 2024 which were shared with Dudley Council Countryside Services Team, indicate that the smaller GCN breeding ponds are in a good condition with newts recorded at each.

6.2.25 As set out in **Section 5.4**, Natural England's SIP[168] and consultation with Dudley Council Countryside Services Team indicates that anti-social behaviours, such as use of off-road vehicles, unlicensed grazing, use of larger ponds by anglers, campfires, night fishing, the presence of non-native alpine newts and fragmentation of GCN habitat are a particular risk to GCN populations at the site. **Section 5.4** also highlights the work Dudley Council is currently undertaking on the creation of a GCN corridor to connect the landscape and provide connectivity between Fens Pools SAC and other GCN populations.

[165] Natural England (2014) European Site Conservation Objectives for Fens Pools SAC. Available at: https://publications.naturalengland.org.uk/publication/5327609814581248 [Accessed 10.06.24]

[166] Correspondence with Dudley Countryside Services Team on 19th June 2024.

[167] Canal & Rivers Trust. Wolverhampton Local Plan: Issues and Preferred Options. Letter. 9th April 2024.

[168] Natural England (2014) Site Improvement Plan: Fens Pool. Available at: https://publications.naturalengland.org.uk/publication/6307825315741696 [Accessed 19/06/24]

6.2.26 Polices set out in **paragraphs 6.2.5** to **6.2.7** will ensure water discharges from new development set out in the WLP are managed to ensure no deterioration in water quality from surface water run-off. In addition, water quality modelling undertaken as part of the WCS has indicated that there will be no significant deterioration downstream of any European site.

6.2.27 Taking into consideration the protection that WLP policies give to water quality, outputs of consultation with Severn Trent Water and the location of allocations in relation to the SAC (more than 5.7km to the north), the favourable condition of the SAC and status of GCN breeding population, it can be concluded that there will be no AIOSI as a result of the WLP either alone or in-combination on the Fens Pools SAC.

Humber Estuary SAC and Ramsar

6.2.28 The Humber Estuary is the UK's second-largest coastal plan estuary (370 km^2) consisting of extensive wetland and coastal habitats and nutrient-rich sediment that supports a wide variety of wintering, passage and breeding birds (especially geese, ducks and waders)[169]. As noted in **Section 3.5**, migratory species of fish for which the Humber Estuary SAC and Ramsar sites have been designated have the potential to use watercourses which are hydrologically linked to the Plan area for parts of their lifecycle, notably spawning. A change in the quality of water in these upstream spawning locations has the potential to adversely impact these qualifying features.

6.2.29 Polices set out in **paragraphs 6.2.5** to **6.2.7** will ensure water discharges from new development set out in the WLP are managed to ensure no deterioration in water quality from surface water run-off. Severn Trent Water identifies the estimated spare capacity at each STWs serving Wolverhampton, resulting in a 'low' impact on the STWs as a result of the WLP for 78% of the STWs[170]. A 'medium' impact is predicted due to estimated spare capacity at Minworth Works and performance at this site will be monitored by STW to assess if and when investment may be required.

6.2.30 Taking into consideration the protection that WLP policies give to water quality and outputs of consultation with Severn Trent Water it can be concluded that there will be no AIOSI as a result of the WLP either alone or in-combination on the Humber Estuary SAC and Ramsar.

[169] Yorkshire Marine Nature Partnership. Nd. Humber Estuary SPA. Available at: https://yorkshiremarinenaturepartnership.org.uk/manage/marine-protected-areas/humber-estuary-spa/ [Accessed 29.05.24]

[170] Severn Trent. Wolverhampton Wastewater Treatment Works Assessment. Letter. 25th September 2024.

Severn Estuary SAC and Ramsar

6.2.31 As set out in **Section 3.5**, the Severn Estuary SAC, SPA and Ramsar is located between Wales and England with extensive intertidal mudflats and sandflats, rocky platforms and islands[171]. The Severn Estuary SAC hosts estuaries, mudflats and sandflats not covered by seawater at low tide, Atlantic salt meadows, sandbanks covered by sea water, and reefs. The site also supports Sea Lamprey (*Petromyzon marinus*), River Lamprey (*Lampetra fluviatilis*) and Twaite Shad (*Alosa fallax*).

6.2.32 Migratory species of fish for which the Severn and Humber Estuary SAC and Ramsar sites have been designated have the potential to use watercourses which are hydrologically linked to the Plan area for parts of their lifecycle, notably spawning. A change in the quality of water in these upstream spawning locations has the potential to adversely impact these qualifying features.

6.2.33 Polices set out in **paragraphs 6.2.5** to **6.2.7** and STWs capacity information as set out in **paragraph 6.2.14** will ensure water discharges from new development set out in the WLP are managed to ensure no deterioration in water quality from surface water run-off.

6.2.34 Taking into consideration the protection that WLP policies give to water quality and outputs of consultation with Severn Trent Water it can be concluded that there will be no AIOSI as a result of the WLP either alone or in-combination on the Severn Estuary SAC and Ramsar.

6.3 Water quantity Appropriate Assessment

Introduction

6.3.1 Development can reduce catchment permeability and the presence of drainage networks may be expected to remove runoff from urbanised catchments. This may result in changes in run off rates from urbanised areas to European sites or watercourses which connect to them and therefore a change in water levels. Water mains leakage and sewer infiltration may also affect water levels. In addition, supply to meet water demand associated with new development (residential and employment development supported by the WLP) also has the potential to affect water balances at hydrologically sensitive European sites which are connected to the Plan area. European sites which are located within a WRZ area within which the WLP is also located have been screened in for further consideration in this AA (see **Table 3.4** for scoping outputs).

6.3.2 The following European sites have the potential to be impacted by water quantity effects as a result of the WLP:

- Midland Meres & Mosses Phase 1 Ramsar – Berrington Pool, Shropshire SSSI, Bomere, Shomere and Betton Pools SSSI, and Marton Pool, Chirbury SSSI

[171] UK Government. Severn Estuary SAC and SPA. Available at: https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://assets.publishing.service.gov.uk/media/5dc1525ded915d1cfe538e44/Severn_Estuary_SAC_and_SPA_Factsheet.pdf&ved=2ahUKEwju_b2NubKGAxVJQUEAHS8sB0YQFnoECBIQAQ&usg=AOvVaw1C6EHSU86RzAz-fz2HUmWY [Accessed 29.05.24]

- Midland Meres & Mosses Phase 2 Ramsar – Aqualate Mere SSSI and Hencott Pool SSSI
- Mottey Meadows SAC

Mitigation and Appropriate Assessment

6.3.3 Together the Government, the EA and the water companies are responsible for preparing plans and strategies and implementing a regulatory framework to ensure there is enough water for the future needs of both people and the environment. This is undertaken through a catchment-based approach and provides protection for European sties and ensures compliance with the WFD[172].

6.3.4 As set out in **Section 3.5**, Severn Trent Water supplies water to Wolverhampton. The Severn Trent Water WRMP[173] forecasts a deficit that is likely to develop between supply and demand for water over time unless action is taken. The WRMP outlines a number of demand management measures that need to be taken to ensure continued sustainable sources of water supply. As part of the evidence base that supported the now withdrawn draft BCP, a Water Cycle Study (WCS) was prepared[174]. This was undertaken through consultation with Severn Trent Water, the EA and neighbouring LPAs. Through this work, Severn Trent Water advised that if growth in the Black Country was in line with their forecast, then they do not have concerns regarding water resources. These findings have been verified on the basis of the growth proposed within the emerging WLP specifically through the plan making process[175]. In preparing the WLP, the Council has been in ongoing liaison with the water companies, to ensure that appropriate and sufficient supply can be made for infrastructure, and that the emerging growth proposals can be supported[176].

6.3.5 The Water Industry Act 1991, as amended by the Water Act 2003, made it a statutory requirement for water companies to produce and maintain a Drought Plan every 5 years. A Drought Plan sets out the framework for a water company to follow in times of drought and dry weather to maintain water supply and links strategically with the WRMPs. The Severn Trent Water Drought Plan[177] tests a number of drought / dry weather scenarios under different climatic conditions to show that supply can be maintained.

[172] European Commission. Water Framework Directive. Available at: https://environment.ec.europa.eu/topics/water/water-framework-directive_en [Accessed 11.06.24].

[173] Severn Trent Water (2019) Waste Resources Management Plan 2019. Available at: https://SLP.stwater.co.uk/content/dam/stw-plc/our-plans/severn-trent-water-resource-management-plan.pdf [Accessed: 04/06/24].

[174] JBA Consulting (May 2020) Black Country Councils Water Cycle Study: Scoping Study - Final Available at: https://blackcountryplan.dudley.gov.uk/t2/p4/t2p4h/ [Accessed: 04/06/24].

[175] Severn Trent. Wolverhampton Wastewater Treatment Works Assessment. Letter. 25th September 2024.

[176] Severn Trent. Wolverhampton Wastewater Treatment Works Assessment. Letter. 25th September 2024.

[177] Severn Trent Water (2022) Drought Plan 2022-2027. Available at: https://www.severntrent.com/content/dam/stw-plc/water-resource-zones/drought-plan-2022-2027.pdf [Accessed 03.06.24].

6.3.6 As set out in **Section 3.5**, abstractions for water supply are managed by the EA through licences issued in line with their CAMS process.

6.3.7 In addition, the WLP sets out protective policies against water quantity impacts. Policy ENV7 (Canal Network) protects water resource availability in the canal and the wider environment. Policy ENV10 (High Quality Design) requires development to be designed to mitigate climate change impacts by protecting and improving water features. Policy ENV12 (Flood Risk) protects against floods and requires development to be accompanied by a surface water drainage strategy. Surface water drainage strategies are required for all major developments, as outlined in Policy ENV13 (Sustainable Drainage Systems and Surface Water Management). Finally, Policy ENV14 (Energy and Sustainable Design) requires all developments for multiple occupation to meet water efficiency standards of 110l/person/day.

6.3.8 Water supply issues will be addressed through the higher-level water planning framework and licencing process (RBMP, WRMP, Drought Plans and CAMS). WLP policies to improve water efficiency (Policy ENV12) will also ensure water supplies at European sites can be met to meet the requirements of European sites. It can therefore be concluded that there will be no adverse impacts on the integrity of any European site, either alone or in-combination, due to a change in water quantity as a result of the WLP.

7 Recreational Pressure Appropriate Assessment

7.1 Introduction

7.1.1 The following chapter of the AA focuses on assessing more precisely the ecological impacts of recreational pressure effects on the qualifying features of Cannock Chase SAC as set out in **Chapter 4** due to WLP growth in-combination.

7.1.2 Policies with the potential to have likely significant recreational effects and which are therefore screened into the AA include (see **Appendix D**):

- Policy CSP1 – Spatial Strategy
- Policy HOU1 – Delivering Sustainable Housing Growth (and the site policies for housing allocations which are set out in Table 12 of Section 13 of the WLP)
- Policy HOU5 – Accommodation for Gypsies and Travellers and Travelling Showpeople
- Policy CEN2 – Wolverhampton's Centres

7.2 Baseline information

Introduction

7.2.1 Increased recreational pressure at European sites can result in damage to habitats and changes in behaviour to animals such as birds at nesting and feeding sites. This can be caused by erosion and compaction, troubling of grazing stock, spreading of invasive species, dog fouling, and tree climbing among other recreational impacts. Typically, disturbance of habitat and species is the unintentional consequence of people's presence which can impact distribution of habitat types and breeding success and survival. Increased development has the potential to increase recreational pressures upon European sites which are accessible to the public.

Cannock Chase SAC

7.2.2 Cannock Chase SAC is located approximately 11.8km to the north of the Plan area and therefore, Wolverhampton lies within the SAC's 15km ZOI (see **paragraph 3.6.8**). The SAC is designated for its wet heathland with cross-leaved heath and European dry heaths[178]. As outlined in **paragraph 5.2.4**, Cannock Chase SSSI, which underpins Cannock Chase SAC, is comprised of 30 units. One of the units (035) is in a 'favourable condition', 26 are in an 'unfavourable recovering' condition, and three (025, 026 and 028) are in an 'unfavourable no change' condition[179]. The 'unfavourable no change' condition is a result of poor tree and bracken control and water abstraction (unit 026).

7.2.3 Recreational pressure is not identified in the SIP or Supplementary Advice Notes[180]. However, in 2024 Natural England identified disturbance and recreational impacts as a result of sporting activities and recreational disturbance as a threat at the SAC[181].

7.2.4 As outlined in **paragraph 3.6.8**, a large body of work has been undertaken through the Cannock Chase SAC Partnership to define recreational impacts at the SAC. This research identified recreational impacts including the widening of paths, damage to path surfaces, eutrophication, litter and dumping and vandalism[182].

7.2.5 Cannock Chase is an internationally important site for wildlife, a Country Park and an Area of Outstanding Natural Beauty (AONB) and therefore is popular with visitors. Almost 20% of the Cannock Chase AONB is legally designated as a SAC for its heathland[183].

7.2.6 An increase in development from the WLP has the potential to increase recreational pressure on the SAC and undermine its ability to achieve relevant conservation objectives.

[178] Natural England (2018) Cannock Chase SAC Conservation Objectives. Available at: https://publications.naturalengland.org.uk/file/4840312833048576 [Accessed 21/08/24].

[179] Natural England. Cannock Chase SSSI – Condition of Units. Available at: https://designatedsites.naturalengland.org.uk/SiteFeatureCondition.aspx?SiteCode=S1004497&SiteName=Cannock%20Chase%20SSSI [Accessed 21/08/24].

[180] Natural England (2020) Cannock Chase SAC Conservation Objectives Supplementary Advice. Available at: https://designatedsites.naturalengland.org.uk/TerrestrialAdvicePDFs/UK0030107.pdf [Accessed 21/08/24].

[181] Natural England. Cannock Chase SSSI – Pressures. Available at: https://designatedsites.naturalengland.org.uk/SitePressures.aspx?SiteGuid=47aa95e3-5a50-e411-a6ba-000d3a2004ef&SiteCode=S1004497&SiteName=Cannock%20Chase%20SSSI [Accessed 21/08/24].

[182] J. White, R. McGibbon & J. Underhill-Day (2012) Impacts of Recreation to Cannock Chase SAC. Unpublished report. Footprint Ecology.

[183] Have Your Say Cannock Chase. Cannock Chase SAC Consultation. Available at: https://haveyoursaycannockchase.org.uk/about/ [Accessed 30/08/24].

7.3 Mitigation

7.3.1 As noted in **Section 3.6**, to manage identified recreational pressures at the SAC a 15km recreational ZOI (see **Figure 3.3**) has been established through evidence collated by the Cannock Chase SAC Partnership. Cannock Chase SAC Partnership was formalised in 2016 to ensure that the ecological integrity of the SAC is maintained and that all legal obligations in relation to the SAC are met[184]. Within this ZOI, new housing developments must provide financial contributions to fund SAMMM to offset the impacts of increasing visitor numbers. The SAMMM developer contribution for the 2024-2025 financial year is set out £344.01 per unit[185]. As identified in the WLP, SAMMM includes habitat management and creation, access management and visitor infrastructure, publicity, education and raising awareness, the provision of additional recreational space within development sites and measures to encourage sustainable travel. Detailed Implementation Plans (DIPs) (see **Box 3**) are plans of action to mitigate for the likely increase in the number of visits resulting from new housing development within the ZOI and are used interchangeably with 'SAMMM'[186].

7.3.2 Policy ENV2 (Development Affecting Cannock Chase Special Area of Conservation) implements this requirement (**Box 3**).

Box 3: Extract from Policy ENV2 – Development Affecting Cannock Chase Special Area of Conservation

1. An appropriate assessment will be carried out for any development resulting in a net increase in homes or that creates visitor accommodation within 15km of the boundary of the Cannock Chase SAC.

2. If the appropriate assessment determines that the development is likely to have an adverse impact upon the integrity of Cannock Chase SAC, then the developer will be required to demonstrate that sufficient measures can be provided to either avoid or mitigate the impact.

3. Acceptable mitigation measures include proportionate financial contributions towards the current agreed Cannock Chase SAC Partnership, Detailed Implementation Plans (DIPs) or any alternative mitigation strategies which may be agreed in future.

7.3.3 In addition, ENV1 (Nature Conservation) safeguards nature conservation within and outside Wolverhampton to ensure that there will be no adverse impacts on the integrity of European sites. The policy also requires all developments to positively contribute to the biodiversity and geodiversity of Wolverhampton.

[184] Have Your Say Cannock Chase. Cannock Chase SAC consultation. Available at: https://haveyoursaycannockchase.org.uk/about/ [Accessed 21/08/24].

[185] Cannock Chase Council (2024) Cannock Chase Special Area of Conservation (SAC). Available at: https://www.cannockchasedc.gov.uk/residents/planning-and-building-control/planning-policy/cannock-chase-special-area-conservation-sac [Accessed 21/08/24].

[186] Cannock Chase Council. Memorandum of Understanding of the Cannock Chase SAC Partnership. Available at: https://www.cannockchasedc.gov.uk/sites/default/files/site-old/sac-partnership-memorandum-of-understanding-final-24-october-2022.pdf [Accessed 13/09/24].

7.3.4 Policy ENV8 (Open Space and Recreation) sets out requirements for new development to provide open space provision in line with national requirements. Policy ENV9 (Playing Fields and Sports Facilities) protects existing and encourages new playing fields. These policies help to divert recreational activity away from Cannock Chase SAC.

7.4 Appropriate Assessment

7.4.1 As shown in **Figure 7.1**, only the north-eastern section of the Plan area lies within 15km of Cannock Chase SAC and the recreational ZOI. This includes five allocations put forward in the WLP. However, two of these allocations are employment (E1 and E2) and therefore will not increase recreational pressure (see **Appendix E**).

7.4.2 The following three residential allocations are located within 15km of Cannock Chase SAC and the recreational ZOI (**Figure 7.1**).

- H22 – Former Probert Court / Health Centre, Probert Road – allocated for approximately 35 dwellings (located approximately 14.4km from Cannock Chase SAC)
- H24c – Tarrans Housing Renewal (Wood End – Orchard Road) – H24 is allocated for approximately 12 dwellings (located approximately 13.8km from Cannock Chase SAC)
- H24d – Tarrans Housing Renewal (Lincoln Green) - H24 is allocated for approximately 99 dwellings (located approximately 13.5km from Cannock Chase SAC)

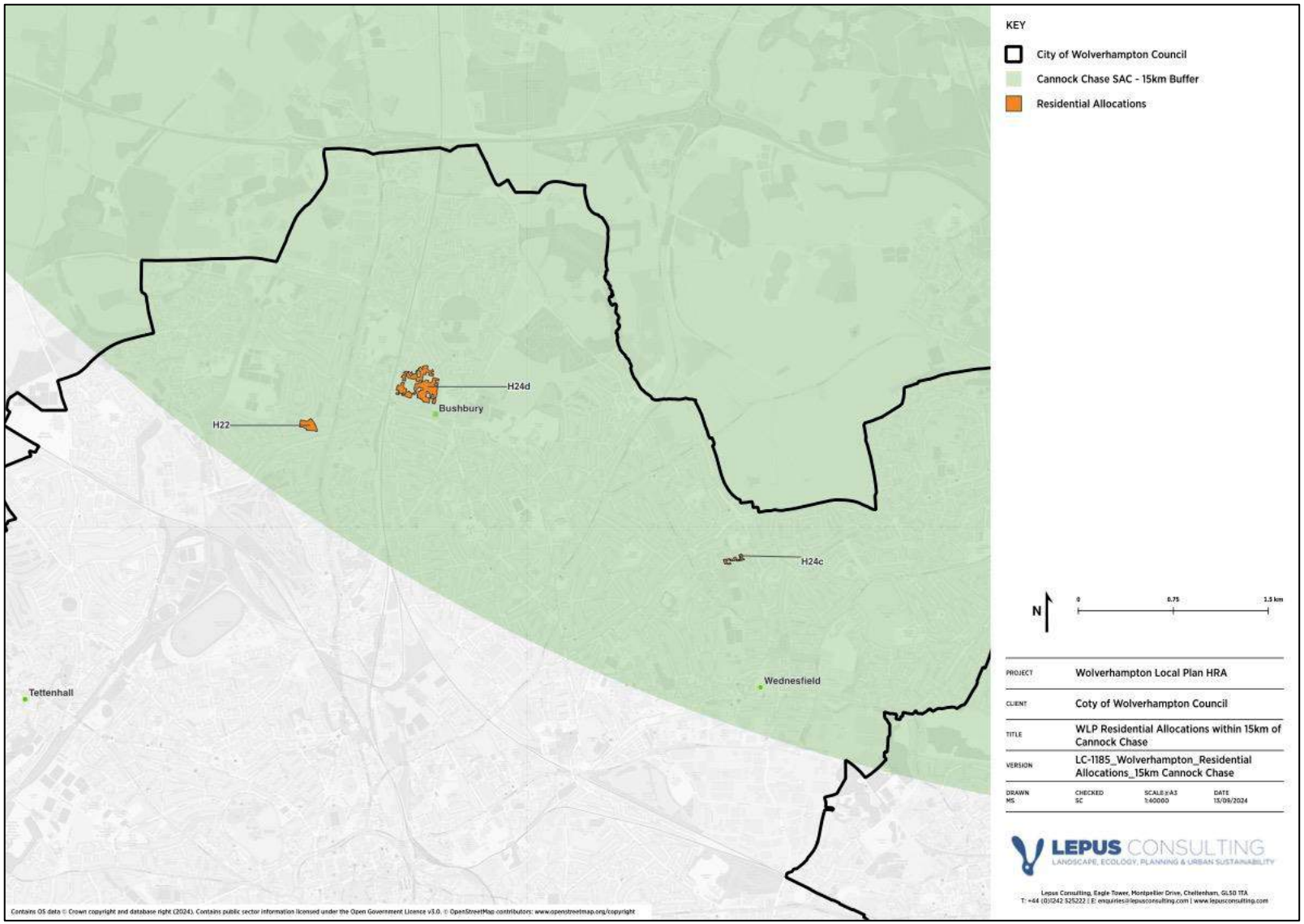

Figure 7.1: *WLP residential allocations within 15km of Cannock Chase SAC*

7.4.3 All residential allocations within 15km of Cannock Chase SAC will be required to pay a developer contribution towards the SAMMM. This scheme will see the implementation of SAMMM and DIPs to ensure no AIOSI at Cannock Chase SAC due to development from the WLP in-combination with other plans and projects which deliver growth within the ZOI.

7.4.4 The requirement for new development to contribute towards SAMMM and DIPs implemented by the Cannock Chase Partnership is secured through the WLP at Policy ENV2 (Development Affecting Cannock Chase Special Area of Conservation) (**Box 3**).

7.4.5 Taking this mitigation into consideration it can be concluded there will be no adverse impact on the site integrity of Cannock Chase SAC due to increased recreational pressure from WLP growth either alone or in-combination.

8 Next Steps

8.1 Summary

8.1.1 The WLP is not directly connected with or necessary to the management of any European site. A screening assessment was therefore undertaken which identified a number of LSEs associated with the Publication WLP at Regulation 19. Taking no account of mitigation measures, the WLP has the potential to affect the following European sites:

- Cannock Chase SAC
- Cannock Extension Canal SAC
- Fens Pools SAC
- Humber Estuary Ramsar
- Humber Estuary SAC
- Midland Meres & Mosses Phase 1 Ramsar
- Midland Meres & Mosses Phase 2 Ramsar
- Mottey Meadows SAC
- Severn Estuary Ramsar
- Severn Estuary SAC

8.1.2 The HRA therefore progressed to the next stage of the HRA process: Appropriate Assessment. The following matters were explored in more detail:

- Impacts on designated features affected by a possible deterioration in air quality;
- Impacts on water quality and quantity associated with increased levels of built development;
- Impacts associated with increased recreational pressure; and,
- Consideration of impacts at associated functionally linked land.

8.1.3 A range of potential threats and pressures that might be exacerbated by the WLP were identified through the assessment process. The Precautionary Principle has been used in circumstances where likely effects were considered to be uncertain. The protective policies set out in the WLP, alongside existing protection measures in existing high level strategic and planning policy frameworks, have been factored into the assessment process.

8.1.4 Taking into consideration these factors, it is concluded that the WLP would have no adverse impact on site integrity at any European site, either alone or in-combination.

8.2 Next steps

8.2.1 The purpose of this report is to inform the HRA of the WLP using best available information.

8.2.2 The Council, as the Competent Authority, has responsibility to make the Integrity Test, which can be undertaken in light of the conclusions set out in this report.

8.2.3 This report will be submitted to Natural England, the statutory nature conservation body, for formal consultation. The Council must 'have regard' to Natural England's representations under the provisions of the Habitats Regulations prior to making a final decision as to whether they will 'adopt' the conclusions set out within this report as their own.

Appendix A: In-Combination Assessment

Plans and Policies	Plan Status	Summary of housing/employment – Key elements of the WLP that could cause in-combination effects	Summary of HRA findings	Potential in-combination Likely Significant Effect (LSE)
Birmingham Development Plan[1]	The Birmingham Development Plan (BDP) 2031 was adopted by Birmingham City Council on the 10th January 2017. The Council are currently working on a new Local Plan, the Birmingham Local Plan. Consultation on the Issues and Options stage concluded in December 2022. The Plan is currently at the Preferred Options stage. The Plan is scheduled to be adopted late 2026.	Approximately 51,100 dwellings, two regional investment sites of 20ha and 25ha and a 71ha employment site for the plan period to 2031. The new Local Plan will guide decisions on development up to 2042. Once the Birmingham Local Plan has been adopted, it will replace the following plans: • Birmingham Development Plan (2017) • Aston, Newton and Lozells Area Action Plan (2012) • Longbridge Area Action Plan (2009)	The BDP was subject to an HRA which concluded there were no likely adverse impacts on the integrity on European sites. However, the Council should continue to regard the need to protect these sites when considering development proposals. No HRA for the Birmingham Local Plan was available online at the time of writing.	The combined impact of neighbouring authority growth, in-combination with the WLP, on air quality and hydrology will be considered further in the HRA process.
Bromsgrove District Plan[2]	The Bromsgrove District Plan 2011-2030 was adopted on the 25th January 2017. The Local Plan review has begun. The preferred options consultation took place in 2018 with a district plan review and further update in 2019.	Approximately 7,000 dwellings over the period 2011-2030. A minimum of 28ha employment growth.	At the time of writing an HRA has not been published to support the plan review.	The combined impact of neighbouring authority growth, in-combination with the WLP, on air quality and hydrology will be considered further in the HRA process.

[1] Birmingham City Council (2017) Adopted Birmingham Development Plan. Available at: https://www.birmingham.gov.uk/downloads/file/5433/adopted_birmingham_development_plan_2031 [Accessed: 07/06/24].

[2] Bromsgrove District Council (2017) Bromsgrove District Plan 2011-2030. Available at: https://www.bromsgrove.gov.uk/media/samhiyxl/bromsgrove-district-plan-2011-2030.pdf [Accessed: 07/06/24].

Plans and Policies	Plan Status	Summary of housing/employment – Key elements of the WLP that could cause in-combination effects	Summary of HRA findings	Potential in-combination Likely Significant Effect (LSE)
Cannock Chase Local Plan	The Cannock Chase Local Plan (Part 1) was adopted in 2014[3]. The Council approved the Local Plan Pre-Submission (Regulation 19) Document in 2023. The Regulation 19 consultation ran from February to March 2024[4].	The Local Plan provides for 5,300 new houses within the district between 2006 – 2028 and 91ha of employment land has been identified as available: The Local Plan Pre-Submission Document outlines a minimum of 5,808 dwellings to be delivered between 2018 and 2040 (264 dwellings/year), with 500 further dwellings to meet the wider housing market shortfall. Up to 69ha of employment land will be provided.	An HRA[5] was conducted for the Local Plan Pre-Submission Document at Regulation 19 which concludes no adverse effect on the integrity of any European site as a result of habitat loss, recreational pressure, urban effects, and water quality / quantity. Air pollution LSEs could not be screened out at Cannock Chase SAC, Cannock Extension Canal SAC, Pasturefields Salt Marsh SAC and West Midland Mosses SAC and Midland Meres & Mosses Phase 1 Ramsar site due to a lack of traffic data.	The combined impact of neighbouring authority growth, in-combination with the WLP, on air quality, hydrology and public access and disturbance impacts will be considered further in the HRA process. In particular it is noted that this authority forms part of the Cannock Chase SAC Partnership.
Dudley Local Plan[6]	The Council is in the process of preparing a new local plan for the Borough: the Dudley Local Plan 2041. This follows from the Black Country Plan which ceased in October 2022. The Council consulted on the draft Plan at Regulation 18 and Regulation 19 is currently in	The draft Plan sets out the council's vision for the borough, priorities for the plan, preferred policies and proposed housing and employment sites. It aims to deliver at least 10,876 net new homes and at least 25ha of employment land.	An HRA[7] was conducted at Regulation 18, concluding that a full AA is required at Regulation 19. No conclusions were drawn at this stage in terms of adverse impacts on the integrity of any European site.	The combined impact of neighbouring authority growth, in-combination with the WLP, on air quality and hydrology will be considered further in the HRA process.

[3] Cannock Chase (2014) Cannock Chase Local Plan (Part 1) 2014. Available at: https://www.cannockchasedc.gov.uk/sites/default/files/site-old/local_plan_part_1_09.04.14_low_res.pdf [Accessed: 07/08/24].

[4] Cannock Chase (2024) Cannock Chase Local Plan Review. Available at: https://www.cannockchasedc.gov.uk/residents/planning-and-building-control/planning-policy/cannock-chase-local-plan [Accessed 07/08/24].

[5] LUC (2024) Cannock Chase Local Plan HRA Report for Reg. 19 consultation. Cannock Chase District Council. Available at: https://www.cannockchasedc.gov.uk/sites/default/files/document-library/Cannock%20Chase%20Reg19%20HRA%20Report%202024.pdf [Accessed 07/08/24].

[6] Dudley Local Plan. Dudley Metropolitan Borough Council. Available at: https://www.dudley.gov.uk/residents/planning/planning-policy/dudley-local-plan/ [Accessed 07/06/24].

[7] Lepus Consulting. October 2023. Draft Dudley Local Plan 2031 Regulation 19: Habitat Regulations Assessment.

Plans and Policies	Plan Status	Summary of housing/employment – Key elements of the WLP that could cause in-combination effects	Summary of HRA findings	Potential in-combination Likely Significant Effect (LSE)
	preparation. The Plan is expected to be adopted in 2026.			
Lichfield District Council Local Plan[8]	The Council is currently preparing a new Local Plan following the previous plan, Local Plan, being withdrawn from examination in 2023. A call for sites was undertaken between January and March 2024. The previous Local Plan Strategy 2008-2029 was adopted on the 17th February 2015.	n/a	No HRA was available online at the time of writing.	The combined impact of neighbouring authority growth, in-combination with the WLP, on air quality and hydrology will be considered further in the HRA process.
Sandwell Local Plan[9]	The Council is in the process of preparing a new Local Plan, after the production of joint Black Country Plan ceased in October 2022. The Regulation 18 public consultation on the Draft Sandwell Local Plan occurred in November-December 2023. The responses will be used for the	The plan will identify where new employment and housing development will be located and where investment for new infrastructure, such as transport, schools and green space will be made during the period to 2041.	An HRA for the Publication Sandwell Local Plan is currently being conducted. An HRA was conducted for the Draft Local Plan at Regulation 18[10]. The report concluded that there were the following potential LSEs: • Air quality LSEs – in-combination at Fens Pools SAC and Cannock Extension Canal SAC; and	The combined impact of neighbouring authority growth, in-combination with the WLP, on air quality and hydrology will be considered further in the HRA process.

[8] Lichfield District Council (2024) New Local Plan. Available at: https://www.lichfielddc.gov.uk/planning-policy/local-plan-review [Accessed 08/08/24].

[9] Sandwell Metropolitan Borough Council. Sandwell Local Plan. Available at: https://www.sandwell.gov.uk/planning/sandwell-local-plan [Accessed: 14/06/24].

[10] Lepus Consulting (October 2023) Draft Sandwell Local Plan Regulation 18 Habitats Regulations Assessment.

Plans and Policies	Plan Status	Summary of housing/employment – Key elements of the WLP that could cause in-combination effects	Summary of HRA findings	Potential in-combination Likely Significant Effect (LSE)
	next stage, the Publication Sandwell Local Plan. The plan is scheduled to be adopted in 2025/6.	The Draft Local Plan identifies a plan to supply 11,167 homes and 42 ha of employment land in Sandwell.	• Water quality and quantity LSEs – in-combination at Fens Pools SAC, River Mease SAC, Cannock Extension Canal SAC, Severn Estuary SAC, SPA and Ramsar, Humber Estuary SAC, SPA and Ramsar, Ensor's Pool SAC. These European sites and LSEs will be subject to AA at Regulation 19.	
Shropshire Council Local Plan Review	Shropshire Council is currently undertaking a review of a Local Plan Review. The draft Shropshire Local Plan (2016 – 2036)[11] is an advanced and fully formed version of the Local Plan. The draft Plan was submitted for examination in 2021[12].	The Regulation 19 version of the draft Local Plan allocates 30,800 new dwellings and around 300 hectares of employment land over the Plan period from 2016 – 2038.	An HRA was conducted in support of the Local Plan[13]. The HRA concluded that there would be no adverse impacts on the integrity of European sites, with the exception of the Severn Estuary SAC, SPA and Ramsar. Final conclusions of the AA will be made following consultation with Severn Trent Water and the Environment Agency.	The combined impact of neighbouring authority growth, in-combination with the WLP, on air quality and hydrology will be considered further in the HRA process.
South Staffordshire District Council Local Plan Review[14]	The Regulation 19 Publication Plan Consultation closed on the 31st May 2024. The Plan is set to be submitted by June 2025.	The new Local Plan will deliver approx. 1,400 affordable homes between the period 2023-2041. The Local Plan (pre-submission) sets out requirements for a minimum annual average of 227 dwellings per	An HRA[15] was conducted for the South Staffordshire Local Plan Review at the Publication Stage. At the AA stage, adverse effects on the integrity from recreation and water impacts were ruled out, both alone and in-combination for all European sites.	The combined impact of neighbouring authority growth, in-combination with the WLP, on air quality and hydrology will

[11] Shropshire Council (December 2020) Regulation 19: Pre-Submission Draft of the Shropshire Local Plan 2016 to 2038. Available at: https://www.shropshire.gov.uk/media/21100/sd002-draft-shropshire-local-plan.pdf [Accessed 08/08/24].

[12] Shropshire Council. Local Plan Review. Available at: https://www.shropshire.gov.uk/planning-policy/local-planning/local-plan-review/ [Accessed 08/08/24].

[13] Shropshire Council (July 2020) Regulation 18 Pre-Submission Draft Shropshire Local Plan 2016 to 2038. Habitats Regulations Assessment. Available at: https://www.shropshire.gov.uk/media/15608/habitats-regulations-assessment-report-reg-18.pdf [Accessed 08/08/24].

[14] South Staffordshire District Council Local Plan Review. Available at: https://www.sstaffs.gov.uk/planning/planning-policy/local-plan-review [Accessed: 07/06/24].

[15] Liley, D.; Fleming, B. and Rush, E. (2024) Habitats Regulations Assessment (HRA) of the South Staffordshire Local Plan Review 2023-2041 (Publication Plan, Regulation 29). Available at: https://www.sstaffs.gov.uk/sites/default/files/2024-04/05_s_staffs_hra_280324_final_report.pdf [Accessed: 07/06/24].

Plans and Policies	Plan Status	Summary of housing/employment – Key elements of the WLP that could cause in-combination effects	Summary of HRA findings	Potential in-combination Likely Significant Effect (LSE)
		annum from 2023/4 to the end of the plan period (2041). This equates to 4,086 new homes. Employment land of 112.2 ha is available for strategic cross boundary unmet needs from the Black Country.	It was not however possible to rule out adverse effects on integrity relating to air quality as a result of increased traffic. Traffic data and possibly air quality modelling are currently being undertaken.	be considered further in the HRA process.
Stafford Borough Council Local Plan	The new Stafford Borough Local Plan will replace the Plan for Stafford Borough 2011-2031 which was adopted in June 2014[16] and Part 2 of the Plan for Stafford Borough was adopted in January 2017. The Plan review is currently at the Preferred Options stage of the planning process, (Local Plan 2020 – 2040)[17]. The Plan is due to be adopted in October 2024.	Housing provision for 10,700 new homes is set out in the Preferred Options Local Plan 2020-2040 (535 homes/year). At least 80ha of employment land will be delivered.	An HRA[18] was conducted for the Issues and Options stage of the Local Plan. The HRA concluded that there are LSEs as a result of the Plan. However, this is an early stage HRA and does not account for mitigation measures.	The combined impact of neighbouring authority growth, in-combination with the WLP, on air quality, hydrology and public access and disturbance impacts will be considered further in the HRA process. In particular it is noted that this authority forms part of the Cannock Chase SAC Partnership

[16] Stafford Borough Council (2014) The Plan for Stafford Borough 2011 – 2031, Adopted 19 June 2014. Available at: https://www.staffordbc.gov.uk/sites/default/files/cme/DocMan1/Planning%20Policy/Plan%20for%20Stafford%20Borough/PFSB-Adoption.pdf [Accessed 08/08/24].

[17] Stafford Borough Council (2022) Stafford borough Local Plan 2020 – 2040 Preferred options. Available at: https://www.staffordbc.gov.uk/sites/default/files/cme/DocMan1/Planning%20Policy/New%20Stafford%20Borough%20Local%20Plan%202020-2040/Preferred%20Options/New-Local-Plan-Preferred-Options.pdf [Accessed 08/08/24].

[18] Footprint Ecology (2020) Habitats Regulations Assessment of the new Stafford Borough Local Plan 2020 – 2040: Issues and Options. Available at: https://www.staffordbc.gov.uk/sites/default/files/cme/DocMan1/Planning%20Policy/New%20Stafford%20Borough%20Local%20Plan%202020-2040/Evidence%20Base%20Documents/Habitats_Regulations_Assessment_0.pdf [Accessed 08/08/24].

Plans and Policies	Plan Status	Summary of housing/employment – Key elements of the WLP that could cause in-combination effects	Summary of HRA findings	Potential in-combination Likely Significant Effect (LSE)
Telford and Wrekin Council Local Plan	The Council adopted the Telford & Wrekin Local Plan 2011-2031 in January 2018[19]. The Council is currently in the process of reviewing the Local Plan.	The adopted Local Plan sets out the delivery of 15,555 new dwellings across the borough by 2031. It supported the delivery of 110ha of employment land.	An HRA[20] was conducted for the Local Plan. The HRA concluded that there are no LSEs on any European sites alone or in-combination as a result of the WLP.	The combined impact of neighbouring authority growth, in-combination with the WLP, on air quality and hydrology will be considered further in the HRA process.
Walsall Borough Local Plan[21]	The Council is in the process of preparing a new local plan, after the production of joint Black Country Plan ceased in October 2022. As per the Local development Scheme, the Council is working on the Issues and Options document under Reg 18.	The plan will include detailed policies and provisions for housing and employment allocations.	No HRA was available at the time of writing.	This plan has the potential to act in-combination with the WLP through increased residential and employment development which may trigger in-combination air quality and hydrology LSEs
Wyre Forest District Council Local Plan	The District Local Plan was adopted in April 2022[22].	This Plan allocates 5,520 dwellings and 29ha of employment land between 2016-2036.	The combined impact of neighbouring authority growth in-combination with the WLP on air quality, hydrology and public access and disturbance impacts will be considered further in the HRA process.	The combined impact of neighbouring authority growth, in-combination with the WLP, on air quality and hydrology will be considered further in the HRA process.

[19] Telford & Wrekin Co-operative Council (2018) Telford & Wrekin Local Plan 2011-2031. Available at: https://apps.telford.gov.uk/downloads/localplan/Telford_and_Wrekin_Local_Plan_2011_2031_adopted_Jan_2018.pdf [Accessed 28/08/24].

[20] Telford & Wrekin Council (June 2016) Telford & Wrekin Local Plan Submission Version. Habitats Regulations Assessment Screening Report. Available at: https://www.telford.gov.uk/download/downloads/id/4364/a4_twlp_hra_screening_report_-_submission_version.pdf [Accessed 28/08/24].

[21] Walsall Council. Walsall Borough Local Plan. Available at: https://go.walsall.gov.uk/planning-and-building-control/planning-policy/future-planning-policy [Accessed: 07/06/24].

[22] Wyre Forest District Council (2019) Wyre Forest District Local Plan 2016-36 Amendments to the Pre-Submission Publication Document. Available at: https://www.wyreforestdc.gov.uk/planning-and-buildings/planning-policy/wyre-forest-district-local-plan-2016-2036/ [Accessed 08/08/24].

Plans and Policies	Plan Status	Summary of housing/employment – Key elements of the WLP that could cause in-combination effects	Summary of HRA findings	Potential in-combination Likely Significant Effect (LSE)
The West Midlands Local Transport Plan[23]	Transport for West Midlands (TfWM) is currently updating the Local Transport Plan for the West Midlands Combined Authority (7 metropolitan districts and boroughs). The Core Strategy has been adopted and TfWM is currently consulting on a draft 'Big Moves' plan.	The Plan sets out policies to promote safe, integrated, efficient and economic transport to, from and within the area. The Core Strategy outlines a vision for improving accessibility, reducing traffic and electrifying transport.	An HRA[24] was conducted alongside the Core Strategy in February 2022. This was a high-level assessment of the Core Strategy in the absence of detailed project-specific information. The HRA concluded that the Plan could be delivered to avoid adverse effects on the integrity of any European sites through standard mitigation techniques. The HRA should be updated accordingly with Plan progress.	The combined impact of Local Transport Plan strategies, in-combination with WLP growth, on traffic related air quality will be considered further in the HRA process.
Severn River Basin Management Plan (RBMP)	The Severn RBMP was updated in October 2022[25].	The Plan provides an overview of river basin planning in England and Wales for the Severn River Basin District. It includes objectives for each water body and a summary of the measures necessary to reach those objectives.	The RBMP was supported by an HRA[26]. This concluded that, at the strategic plan level, the RBMP is not likely to have any significant effects on any European sites, alone or in combination with other plans or projects. Given this conclusion, there was no requirement, at this strategic plan level, to progress to the next stage of the HRA (an 'appropriate assessment' to examine the question of adverse effects on the integrity of European sites). The RBMP does not specify exactly where or how measures should be implemented, this will be determined at either	The RBMP actions are focused on water body and water dependent European site improvements. Whilst development activities arising from Local Development Plans (including the WLP) may inhibit the ability of the RBMP to achieve objectives relating to European site protected

[23] West Midlands Combined Authority (2016) West Midlands Strategic Transport Plan. Available at https://www.tfwm.org.uk/who-we-are/our-strategy/local-transport-plan/ [Accessed 07/06/24].

[24] Atkins (2022) Transport for the West Midlands Local Transport Plan Core Strategy. Habitat Regulations Assessment Stage 1: Screening and Stage 2: Appropriate Assessment. Available at: https://www.tfwm.org.uk/media/iviebt3z/tfwm-ltp5-hra-v2.pdf [Accessed 07/06/24].

[25] Environment Agency (2022) Severn River Basin Management Plan summary and cross border catchments. Available at : https://www.gov.uk/government/publications/severn-river-basin-management-plan-summary-and-cross-border-catchments-england-and-wales/severn-river-basin-management-plan-summary-and-cross-border-catchments-england-and-wales [Accessed 07/06/24].

[26] Environment Agency (2022) River basin management plan for the Severn River Basin District Habitats Regulations Assessment. Available at: https://assets.publishing.service.gov.uk/media/635247738fa8f554c470abf5/Severn_river_basin_management_plan_2022_HRA.pdf [Accessed 07/06/24].

Plans and Policies	Plan Status	Summary of housing/employment – Key elements of the WLP that could cause in-combination effects	Summary of HRA findings	Potential in-combination Likely Significant Effect (LSE)
			a lower-tier plan or project level and this is taken into consideration in the HRA. The HRA also draws on detailed mitigation measures and procedures currently in place.	areas, the overall effect of the RBMP is to promote management towards Good Ecological Potential (GEP) and Good Ecological Status (GES).
Humber River Basin Management Plan (RBMP)	The Humber RBMP was updated in October 2022[27].	The Plan provides an overview of river basin planning in England and Wales for the Humber River Basin District. It includes objectives for each water body and a summary of the measures necessary to reach those objectives.	The RBMP was supported by an HRA[28]. This concluded that, at the strategic plan level, the RBMP is not likely to have any significant effects on any European sites, alone or in combination with other plans or projects. Given this conclusion, there is no requirement, at this strategic plan level, to progress to the next stage of the HRA (an 'appropriate assessment' to examine the question of adverse effects on the integrity of European sites). The RBMP does not specify exactly where or how measures should be implemented, this will be determined at either a lower-tier plan or project level and this is taken into consideration in the HRA. The HRA also draws on detailed mitigation measures and procedures currently in place.	The RBMP actions are focused on water body and water dependent European site improvements. Whilst development activities arising from Local Development Plans (including the WLP) may inhibit the ability of the RBMP to achieve objectives relating to European site protected areas, the overall effect of the RBMP is to promote management towards GEP and GES.
Severn Trent Water Resources Management	The Draft Water Resources Management Plan was devised in 2024. The next step is to create a	The draft Plan describes a likely future supply / demand deficit of 244Ml/d by plan year 2040-2041 if no action is taken. It sets out the long-term	The WRMP was supported by an HRA[30]. This concluded that the WRMP is likely to have a significant effect on the following screened in Local Plan European sites within the statutory	This plan aims to protect the water environment and takes account for future water demand. It is

[27] Environment Agency (2022) Humber river basin district management plan: updated 2022. Available at: https://www.gov.uk/guidance/humber-river-basin-district-river-management-plan-updated-2022 [Accessed 07/06/24]

[28] Environment Agency (2022) River basin management plan for the Humber River Basin District Habitats Regulations Assessment. Available at: https://assets.publishing.service.gov.uk/media/63524462d3bf7f193d35a0f7/Humber_river_basin_management_plan_2022_HRA.pdf [Accessed 03/06/24].

[30] Severn Trent Water (2022) Habitats Regulations Assessment: Draft Water Resources Management Plan 2024. Available at: https://www.severntrent.com/content/dam/dwrmp-st-v2/STdWRMP24-HRA-Issue-2-redacted.pdf [Accessed 07/06/24].

Plans and Policies	Plan Status	Summary of housing/employment – Key elements of the WLP that could cause in-combination effects	Summary of HRA findings	Potential in-combination Likely Significant Effect (LSE)
Plan (WRMP) [29].	final Plan which is scheduled to be published mid 2024.	strategy until 2085 to prepare for the future. The Plan proposes ongoing leakage reduction measures, water efficiency and metering activities. Some current EA abstraction licenses will be capped to prevent WFD deterioration. It sets out a vision of 'no/low regret' solutions, particularly in response to the challenges of climate change on water demand and supply. The draft builds on previous goals to reduce unsustainable abstraction. Mainly focuses on water availability but considers water quality through design. Severn Trent Water will continue to restore rivers to improve habitats and ecological resilience to low flows.	25 year planning period either alone (I) or in-combination (L): - Cannock Chase SAC - Fens Pools SAC - Humber Estuary SAC and Ramsar - River Mease SAC - Severn Estuary SAC and Ramsar A meaningful AA was not possible at the strategic level for demand-side measures and therefore, the AA is necessarily deferred to the project level. The AA of the supply-side options conclude no adverse impacts on the integrity of any European site through suitable mitigation.	unlikely that the WRMP will have alone or in-combination effects on the water environment.
Severn Trent Water Drought Plan[31]	The Severn Trent Drought Plan was prepared in 2022.	The Drought Plan outlines the operational steps that will be conducted if we face a drought in the next 5 years. It describes how supplies will be enhanced, demands managed, and environmental impacts minimised. It proposes ongoing leakage reduction measures, water efficiency and monitoring and metering activities.	An HRA was not available online.	This plan aims to protect the water environment in times of drought. It is unlikely that the WRMP will have alone or in-combination effects on the water environment.

[29] Severn Trent Water (2024) Draft Water Resources Management Plan: Main Narrative. Available at: https://www.severntrent.com/content/dam/dwrmp24-st/STdWRMP24-Main-Narrative.pdf [Accessed 07/06/24].

[31] Severn Trent Water (2022) Drought Plan 2022-2027. Available at: https://www.severntrent.com/content/dam/stw-plc/water-resource-zones/drought-plan-2022-2027.pdf [Accessed 03/06/24].

Appendix B: Screened In European Site Conservation Objectives, Qualifying Features, Threats and Pressures

Cannock Chase SAC[1]

Conservation objectives:

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

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

Qualifying Features:

H4010. Northern Atlantic wet heaths with *Erica tetralix*; Wet heathland with cross-leaved heath
H4030. European dry heaths

Threats and Pressures at European site which may be affected by the WLP[2,3]:

- Hydrology;
- Air pollution – impact of atmospheric nitrogen deposition; and,
- Recreational disturbance.

Cannock Extension Canal SAC[4]

Conservation objectives:

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- The extent and distribution of the habitats of qualifying species;
- The structure and function of the habitats of qualifying species;
- The supporting processes on which the habitats of qualifying species rely;
- The populations of qualifying species; and
- The distribution of qualifying species within the site.

Qualifying Features:

S1831. *Luronium natans*; Floating water-plantain

Threats and Pressures at European site which may be affected by the WLP[5,6]:

- Hydrology;
- Air pollution – impact of nitrogen deposition; and,

[1] Natural England (2018) Cannock Chase SAC Conservation Objectives. Available at: http://publications.naturalengland.org.uk/publication/6687924741472256 [Accessed 24/06/24].

[2] Natural England (2014) Cannock Chase SAC SIP. Available at: http://publications.naturalengland.org.uk/publication/4957799888977920 [Accessed 24/06/24].

[3] Natural England (2020) Cannock Chase SAC Conservation Objectives Supplementary Advice. Available at: https://designatedsites.naturalengland.org.uk/TerrestrialAdvicePDFs/UK0030107.pdf [Accessed 24/06/24].

[4] Natural England (2018) Cannock Extension Canal SAC Conservation Objectives. Available at: http://publications.naturalengland.org.uk/publication/5063623810482176 [Accessed 24/06/24].

[5] Natural England (2014) Cannock Extension Canal SAC SIP. Available at: http://publications.naturalengland.org.uk/file/6749431462363136 [Accessed: 25/06/24].

[6] Natural England (2018) Cannock Extension Canal SAC Conservation Objectives Supplementary Advice. Available at: https://designatedsites.naturalengland.org.uk/TerrestrialAdvicePDFs/UK0012672.pdf [Accessed 24/06/24].

Cannock Extension Canal SAC[4]

- Disturbance of habitat by human activity.

Fens Pools SAC[7]

Conservation objectives:

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring:

- The extent and distribution of the habitats of the qualifying species;
- The structure and function of the habitats of the qualifying species;
- The supporting processes on which the habitats of the qualifying species rely;
- The populations of qualifying species; and
- The distribution of qualifying species within the site.

Qualifying features:

S1166. *Triturus cristatus*; Great crested newt.

Threats and Pressures at European site which may be affected by the WLP[8,9]:

- Hydrology;
- Habitat fragmentation; and
- Air quality.

Humber Estuary SAC[10]

Conservation objectives:

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

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

Qualifying features:

H1110. Sandbanks which are slightly covered by sea water all the time; Subtidal sandbanks

H1130. Estuaries

[7] Natural England (2018) Fens Pools SAC Conservation Objectives. Available at: http://publications.naturalengland.org.uk/file/6642225895440384 [Accessed 25/06/24].

[8] Natural England (2014) Fens Pools SAC SIP. Available at: http://publications.naturalengland.org.uk/file/4872756676001792 [Accessed 25/06/24].

[9] Natural England (2017) Fens Pools SAC Conservation Objectives Supplementary Advice. Available at: https://designatedsites.naturalengland.org.uk/TerrestrialAdvicePDFs/UK0030150.pdf [Accessed 25/06/24].

[10] Natural England (2018) Humber Estuary SAC Conservation Objectives. Available at: http://publications.naturalengland.org.uk/publication/5009545743040512 [Accessed 24/06/24].

Humber Estuary SAC[10]

H1140. Mudflats and sandflats not covered by seawater at low tide; Intertidal mudflats and sandflats

H1150. Coastal lagoons*

H1310. Salicornia and other annuals colonising mud and sand; Glasswort and other annuals colonising mud and sand

H1330. Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) H2110. Embryonic shifting dunes

H2120. Shifting dunes along the shoreline with *Ammophila arenaria* ("white dunes"); Shifting dunes with marram

H2130. Fixed dunes with herbaceous vegetation ("grey dunes"); Dune grassland

H2160. Dunes with *Hippophae rhamnoides*; Dunes with sea-buckthorn

S1095. *Petromyzon marinus*; Sea lamprey
S1099. *Lampetra fluviatilis*; River lamprey

S1364. *Halichoerus grypus;* Grey seal

Threats and Pressures at European site which may be affected by the WLP[11]:

- Hydrology;
- Direct land take for development;
- Public access/disturbance; and,
- Air pollution – impact of atmospheric nitrogen deposition.

Humber Estuary Ramsar[12]

Ramsar sites do not have the Conservation Objectives in the same way as SPAs and SACs. Information regarding the designation of Ramsar sites is contained in JNCC Ramsar Information Sheets. Ramsar Criteria are the criteria for identifying Wetlands of International Importance. The relevant criteria and ways in which this site meets the criteria are presented in the table below.

Ramsar Criterion	Justification for the application of each criterion
1	The site is a representative example of a near-natural estuary with the following component habitats: dune systems and humid dune slacks, estuarine waters, intertidal mud and sand flats, saltmarshes, and coastal brackish/saline lagoons. It is a large macro-tidal coastal plain estuary with high suspended sediment loads, which feed a dynamic and rapidly changing system of accreting and eroding intertidal and subtidal mudflats, sandflats, saltmarsh and reedbeds. Examples of both strandline, foredune, mobile, semi-fixed dunes, fixed dunes and dune grassland occur on both banks of the estuary and along the coast. The estuary supports a full range of saline conditions from the open coast to the limit of saline intrusion on the tidal rivers of the Ouse and Trent. Wave exposed sandy shores are found in the outer/open coast areas of the estuary. These change to the more moderately exposed sandy shores and then to sheltered muddy shores within the main body of the estuary and up into the tidal rivers. The lower saltmarsh of the Humber is dominated by common cordgrass Spartina anglica and annual glasswort Salicornia communities. Low to mid marsh communities are mostly represented by sea aster

[11] Natural England (2015) Humber Estuary SIP. Available at: http://publications.naturalengland.org.uk/file/5730884670980096 [Accessed 25/06/24].

[12] JNCC (2007) Ramsar Information Sheet: Humber Estuary. Available at: https://rsis.ramsar.org/RISapp/files/RISrep/GB663RIS.pdf [Accessed 25/06/24].

Ramsar Criterion	Justification for the application of each criterion
	Aster tripolium, common saltmarsh grass Puccinellia maritima and sea purslane Atriplex portulacoides communities. The upper portion of the saltmarsh community is atypical, dominated by sea couch Elytrigia atherica (Elymus pycnanthus) saltmarsh community. In the upper reaches of the estuary, the tidal marsh community is dominated by the common reed Phragmites australis fen and sea club rush Bolboschoenus maritimus swamp with the couch grass Elytrigia repens (Elymus repens) saltmarsh community. Within the Humber Estuary Ramsar site there are good examples of four of the five physiographic types of saline lagoon.
3	The Humber Estuary Ramsar site supports a breeding colony of grey seals Halichoerus grypus at Donna Nook. It is the second largest grey seal colony in England and the furthest south regular breeding site on the east coast. The dune slacks at Saltfleetby-Theddlethorpe on the southern extremity of the Ramsar site are the most north-easterly breeding site in Great Britain of the natterjack toad Bufo calamita.
5	Assemblages of international importance: 153,934 waterfowl, non-breeding season (5 year peak mean 1996/97-2000/2001)
6	Species/populations occurring at levels of international importance. Qualifying species/populations (as identified at designation): Species with peak counts in winter: • Common shelduck, *Tadorna tadorna*, NW Europe - 4464 individuals, representing an average of 1.5% of the population (5 year peak mean 1996/7-2000/1) • Eurasian golden plover, *Pluvialis apricaria*, altifrons subspecies, NW Europe, W Continental Europe, NW Africa population - 30,709 individuals, representing an average of 3.3% of the GB population (5 year peak mean 1996/7-2000/1) • Red Knot, *Calidris canutus* islandica subspecies - 28165 individuals, representing an average of 6.3% of the population (5 year peak mean 1996/7-2000/1) • Dunlin, *Calidris alpina alpina*, Europe - 22222 individuals, representing an average of 1.7% of the population (5 year peak mean 1996/7-2000/1) • Black-tailed godwit, *Limosa limosa*, islandica subspecies - 1,113 individuals, wintering, representing an average of 3.2% of the population (5 year peak mean 1996/7-2000/1) • Bar-tailed godwit, *Limosa lapponica*, lapponica subspecies - 2,752 individuals, wintering, representing an average of 2.3% of the population (5 year peak mean 1996/7-2000/1) • Common redshank, *Tringa totanus totanus* - 4632 individuals, representing an average of 3.6% of the population (5 year peak mean 1996/7- 2000/1)
8	The Humber Estuary acts as an important migration route for both river lamprey Lampetra fluviatilis and sea lamprey Petromyzon marinus between coastal waters and their spawning areas.

Threats and Pressures at European site which may be affected by the WLP:

- Water pollution (domestic sewage); and,
- Recreational / tourism disturbance.

Midland Mires and Mosses (Phase 1) Ramsar[13]

Ramsar sites do not have the Conservation Objectives in the same way as SPAs and SACs. Information regarding the designation of Ramsar sites is contained in JNCC Ramsar Information Sheets. Ramsar Criteria are the criteria for identifying Wetlands of International Importance. The relevant criteria and ways in which this site meets the criteria are presented in the table below.

Ramsar Criterion	Justification for the application of each criterion
1	The site comprises a diverse range of habitats from open water to raised bog.
2	Supports a number of rare species of plants associated with wetlands, including five nationally scarce species, together with an assemblage of rare wetland invertebrates (three endangered insects and five other British Red Data Book species of invertebrates).

Threats and Pressures at European site which may be affected by the WLP[14]:
No issues have been identified on this site.

Midland Mires and Mosses (Phase 2) Ramsar[15]

Ramsar sites do not have Conservation Objectives in the same way as SPAs and SACs. Information regarding the designation of Ramsar sites is contained in JNCC Ramsar Information Sheets. Ramsar Criteria are the criteria for identifying Wetlands of International Importance. The relevant criteria and ways in which this site meets the criteria are presented in the table below.

Ramsar Criterion	Justification for the application of each criterion
1	The site comprises a diverse range of habitats from open water to raised bog.
2	Supports a number of rare species of plants associated with wetlands, including the nationally scarce cowbane *Cicuta virosa* and, elongated sedge *Carex elongata*. Also present are the nationally scarce bryophytes *Dicranum affine* and Sphagnum pulchrum. Also supports an assemblage of invertebrates including several rare species. There are 16 species of British Red Data Book insect listed for this site including the following endangered species: the moth *Glyphipteryx lathamella*, the caddisfly *Hagenella clathrata* and the sawfly *Trichiosoma vitellinae.*

Threats and pressures at European site which may be affected by the WLP[16]:
No issues have been identified on this site.

[13] JNCC (2008) Midland Mires and Mosses Phase 1 Ramsar. Available at: https://jncc.gov.uk/jncc-assets/RIS/UK11043.pdf [Accessed: 15/07/24].

14 JNCC (2008) Midland Mires and Mosses Phase 1 Ramsar. Available at: https://jncc.gov.uk/jncc-assets/RIS/UK11043.pdf [Accessed: 15/07/24].

15 JNCC (2008) Midland Mires and Mosses Phase 2 Ramsar. Available at: https://jncc.gov.uk/jncc-assets/RIS/UK11080.pdf [Accessed: 15/07/24].

16 JNCC (2008) Midland Mires and Mosses Phase 2 Ramsar. Available at: https://jncc.gov.uk/jncc-assets/RIS/UK11080.pdf [Accessed: 15/07/24].

Mottey Meadows SAC[17]

Conservation objectives:

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

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

Qualifying Features:

H6510. Lowland hay meadows (*Alopecurus pratensis, Sanguisorba officinalis*)

Threats and Pressures at European site which may be affected by the WLP[18,19]:

- Hydrology;
- Habitat connectivity; and,
- Air quality.

Severn Estuary SAC[20]

Conservation objectives:

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- The extent and distribution of qualifying natural habitats and habitats of qualifying species;
- The structure and function (including typical species) of qualifying natural habitats;
- The structure and function of the habitats of qualifying species;
- The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely;
- The populations of qualifying species; and
- The distribution of qualifying species within the site.

Qualifying features:

H1110. Sandbanks which are slightly covered by sea water all the time; Subtidal sandbanks;

H1130. Estuaries;

H1140. Mudflats and sandflats not covered by seawater at low tide; Intertidal mudflats and sandflats;

H1170. Reefs;

H1330. Atlantic salt meadows (Glauco-Puccinellietalia maritimae); Atlantic salt meadows;

S1095. Petromyzon marinus; Sea lamprey;

S1099. Lampetra fluviatilis; River lamprey; and,

[17] Natural England (2018) Mottey Meadows SAC Conservation Objectives. Available at: https://publications.naturalengland.org.uk/file/5342247969357824 [Accessed 18/07/24].

[18] Natural England (2014) Mottey Meadows SAC SIP. Available at: https://publications.naturalengland.org.uk/file/5135117454409728 [Accessed: 18/07/24].

[19] Natural England (2018) Mottey Meadows SAC Conservation Objectives Supplementary Advice. Available at: https://designatedsites.naturalengland.org.uk/TerrestrialAdvicePDFs/UK0030051.pdf [Accessed 18/07/24].

[20] Natural England (2014) Peak District Dales SAC Conservation Objectives. Available at: https://publications.naturalengland.org.uk/file/6580695786848256 [Accessed 24/06/24].

Severn Estuary SAC[20]

S1103. Alosa fallax; Twaite shad.

Threats and Pressures at European site which may be affected by the WLP[21]:

- Public access/disturbance;
- Impacts of development;
- Hydrology; and,
- Air pollution – impact of atmospheric nitrogen deposition.

Severn Estuary Ramsar[22]

Ramsar sites do not have the Conservation Objectives in the same way as SPAs and SACs. Information regarding the designation of Ramsar sites is contained in JNCC Ramsar Information Sheets. Ramsar Criteria are the criteria for identifying Wetlands of International Importance. The relevant criteria and ways in which this site meets the criteria are presented in the table below.

Ramsar Criterion	Justification for the application of each criterion
1	Due to immense tidal range (second-largest in world), this affects both the physical environment and biological communities.
3	Due to unusual estuarine communities, reduced diversity and high productivity.
4	This site is important for the run of migratory fish between sea and river via estuary. Species include: Salmon Salmo salar; Sea trout S. trutta; Sea lamprey Petromyzon marinus; River lamprey Lampetra fluviatilis; Allis shad Alosa alosa; Twaite shad A. fallax, and Eel Anguilla anguilla. It is also of particular importance for migratory birds during spring and autumn.
5	Assemblages of international importance: Species with peak counts in winter: • 70919 waterfowl (5 year peak mean 1998/99-2002/2003)
6	Species/populations occurring at levels of international importance. Qualifying species/populations (as identified at designation): Species with peak counts in winter: • Tundra swan, *Cygnus columbianus bewickii*, NW Europe - 229 individuals, representing an average of 2.8% of the GB population (5 year peak mean 1998/9-2002/3) • Greater white-fronted goose, *Anser albifrons albifrons*, NW Europe - 2076 individuals, representing an average of 35.8% of the GB population (5 year peak mean for 1996/7-2000/01)

[21] Natural England (2015) Severn Estuary SIP. Available at: http://publications.naturalengland.org.uk/file/4856107648417792 [Accessed 25/06/24].

[22] JNCC (2008) Ramsar Information Sheet: UK11081 Severn Estuary. Available at: https://jncc.gov.uk/jncc-assets/RIS/UK11081.pdf [Accessed 24/06/24].

Ramsar Criterion	Justification for the application of each criterion
	• Common shelduck, *Tadorna tadorna*, NW Europe - 3223 individuals, representing an average of 1% of the population (5 year peak mean 1998/9-2002/3) • Gadwall, *Anas strepera strepera*, NW Europe - 241 individuals, representing an average of 1.4% of the GB population (5 year peak mean 1998/9-2002/3) • Dunlin, *Calidris alpina alpina*, W Siberia/W Europe - 25082 individuals, representing an average of 1.8% of the population (5 year peak mean 1998/9-2002/3) • Common redshank, *Tringa totanus totanus* - 2616 individuals, representing an average of 1% of the population (5 year peak mean 1998/9- 2002/3) Species/populations identified subsequent to designation for possible future consideration under criterion 6. Species regularly supported during the breeding season: • Lesser black-backed gull, Larus fuscus graellsii, W Europe/Mediterranean/W Africa - 4167 apparently occupied nests, representing an average of 2.8% of the breeding population (Seabird 2000 Census) Species with peak counts in spring/autumn: • Ringed plover, Charadrius hiaticula, Europe/Northwest Africa - 740 individuals, representing an average of 1% of the population (5 year peak mean 1998/9-2002/3) Species with peak counts in winter: • Eurasian teal, Anas crecca, NW Europe - 4456 individuals, representing an average of 1.1% of the population (5 year peak mean 1998/9-2002/3) • Northern pintail, Anas acuta, NW Europe - 756 individuals, representing an average of 1.2% of the population (5 year peak mean 1998/9- 2002/3)
8	The fish of the whole estuarine and river system is one of the most diverse in Britain, with over 110 species recorded. Salmon Salmo salar, sea trout S. trutta, sea lamprey Petromyzon marinus, river lamprey Lampetra fluviatilis, allis shad Alosa alosa, twaite shad A. fallax, and eel Anguilla anguilla use the Severn Estuary as a key migration route to their spawning grounds in the many tributaries that flow into the estuary. The site is important as a feeding and nursery ground for many fish species particularly allis shad Alosa alosa and twaite shad A. fallax which feed on mysid shrimps in the salt wedge.

Threats and Pressures at European site which may be affected by the WLP:

- Recreational/tourism disturbance.

Appendix C: Air Quality Assessment

Assessment of Air Quality Impacts on European Sites in Staffordshire, Wolverhampton, Walsall, Sandwell, and Dudley

Air Quality Assessment Report

Sweco UK Limited	Reg. No. 2888385
Project Name	Staffordshire HRA: Traffic & Air Quality
Project Number	65209859
Client	Partnership Authorities
Author	Lee Shelton
Controlled by	Damian Pawson
Approved by	Damian Pawson
Date	2024-10-25
Version	002
Document reference	Partnership Authorities_Assessment of Air Quality Impacts on European Sites_AQ Report_Final_Oct24.docx

Change list

Version	Date	Description of the change	Reviewed	Approved by
001	19/07/24	First Draft	DP	DP
002	25/10/24	Final	DP	DP

Table of contents

1 Introduction

Sweco UK Ltd was commissioned by South Staffordshire District Council (SSDC), on behalf of a partnership of local authorities, to undertake a detailed air quality modelling study to inform an assessment of air quality impacts on relevant European designated sites.

The partnership authorities comprise:

- SSDC
- Stafford Borough Council
- East Staffordshire Borough Council
- Lichfield District Council
- Cannock Chase District Council
- City of Wolverhampton Council
- Dudley Metropolitan Borough Council
- Walsall Metropolitan Borough Council
- Sandwell Metropolitan Borough Council

At the time of assessment (February – October 2024), a number of the partnership authorities are progressing their respective Local Plans, which will direct development throughout the region.

The *Conservation of Habitats and Species Regulations 2017* (as amended) require local authorities to assess whether their Local Plan will result in likely significant effects to European designated sites in and/or near to their administrative areas. The task is achieved by means of a Habitats Regulations Assessment (HRA).

Each Local Plan will generate additional vehicle movements on the local and regional road networks resulting from the development of current and proposed allocated sites. Therefore, vehicle emissions associated with traffic generated by each partnership authority's emerging Local Plan have the potential to impact sensitive habitats within a number of European sites, both 'alone' (i.e. individual Local Plan) and 'in-combination' (i.e. multiple Plans and projects).

Of key concern for European sites are vehicle emissions of nitrogen-containing compounds, such as oxides of nitrogen (NO_x) and ammonia (NH_3), which can contribute to ambient concentrations at nitrogen-sensitive habitats or species within a designated site. Increased emissions of these pollutants can, in turn, increase nutrient nitrogen deposition and/or acid deposition to plants and soils within a designated site, which can have detrimental impacts on flora and fauna. As such, the change in vehicle emissions of NO_x and NH_3 associated with the aforementioned emerging Local Plans form the focus of this assessment.

1.1 Purpose of this Assessment

This study has been commissioned to facilitate an 'in-combination' assessment of air quality impacts at relevant European sites, such that it can be used to support each partnership authority's Local Plan HRA. However, it is acknowledged that updates to this assessment may be required in future as each partnership Local Plan emerges, as dictated by changes to the respective Local Plan periods, site allocations, development mix, and any associated changes to traffic growth and distribution.

The designated sites that form the focus of this air quality assessment were determined through an evidence base and specification developed by Middlemarch Environmental Ltd (March

2023)[1], which included rationales for screening out a number of sites from the HRA process. This was agreed in writing with Natural England[2].

The European designated sites included in this air quality assessment comprise:

- Cannock Chase Special Area of Conservation (SAC)
- Pasturefields Salt Marsh SAC
- Midlands Meres and Mosses Phase 2 Ramsar site (Cop Mere & Oakhanger Moss)
- Cannock Extension Canal SAC
- Fens Pools SAC.

The above European site locations are presented in **Figure 1**.

This air quality assessment has been completed with reference to the specification outlined by Middlemarch Environmental Ltd[1], as detailed herein. Furthermore, this assessment has relied upon the traffic data produced by the appointed transport modelling consultant (Sweco UK Ltd) for the partnership authorities[3], which includes the relevant road links within 200 m of each European site scoped into the assessment.

The results of this assessment have been passed to the appointed ecology consultants for each partnership authority, such that an Appropriate Assessment can be undertaken to determine the likely impacts on the integrity of a European site, where applicable.

This technical air quality assessment report is supported by the following appendices:

- **Appendix A** – Traffic Data Tables (base year and future year scenarios)
- **Appendix B** – Dispersion Modelling Approach & Verification
- **Appendix C** – Air Quality Assessment Results Tables
- **Appendix D** – Middlemarch Environmental Ltd (March 2023) *Creation of an Air Pollution Evidence Base Brief to Support Local Plan HRA*
- **Appendix E** – Letter from Natural England (14 April 2023) to Partnership Authorities confirming agreement with Middlemarch Environmental Ltd evidence base brief

[1] Middlemarch Environmental Ltd (March 2023) *Creation of an Air Pollution Evidence Base Brief to Support Local Plan HRA* (Report no. RT-MME-159172-01,Rev B)

[2] Natural England (14 April 2023) Letter addressed to 'Combined Partnership Authorities' via email, confirming agreement with rationale for screening out certain European sites from requiring detailed air quality impact assessment (Natural England reference: 427535)

[3] Sweco UK Ltd (July 2024) *Traffic modelling to inform an assessment of air quality impacts on European sites in Staffordshire, Wolverhampton, Walsall, Sandwell, and Dudley – Traffic Model Validation and Forecast*

Rev	Date	Amendment Details	Dr'n	Chk'	App'
Rev	06.11.2024	FIRST ISSUE	ABC	ABC	ABC

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Client: South Staffordshire Council

Project Title: Assessment of Air Quality Impacts on European Sites in Staffordshire, Wolverhampton, Walsall, Sandwell, and Dudley

Drawing Title: Figure 1.1 Location of European sites included in the Air Quality Assessment to inform the HRA

Cannock Chase SAC/SSSI

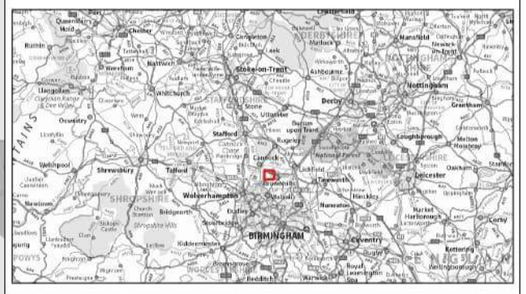
Project Stage			
n/a			
Status: n/a	Status Description: n/a		
Drawn: LFS	Designed: LFS	Checked: DP	Approved: DP
Sheet Size: A3	Scale: 1:27,500	Sweco Ref: 65209859	Revision: P01.1

Drawing Number: 65209859-SWE-XX-XX-D-AQ-0001

Legend

Designated Nature Conservation Sites

- Site of Special Scientific Interest (SSSI)
- Special Area of Conservation (SAC)



Rev	Date	Amendment Details	Dr'n	Chk'	App'
Rev	06.11.2024	FIRST ISSUE	ABC	ABC	ABC

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South Staffordshire Council

Project Title

Assessment of Air Quality Impacts on European Sites in Staffordshire, Wolverhampton, Walsall, Sandwell, and Dudley

Drawing Title

Figure 1.2 Location of European sites included in the Air Quality Assessment to inform the HRA

Cannock Extension Canal SAC/SSSI

Project Stage			
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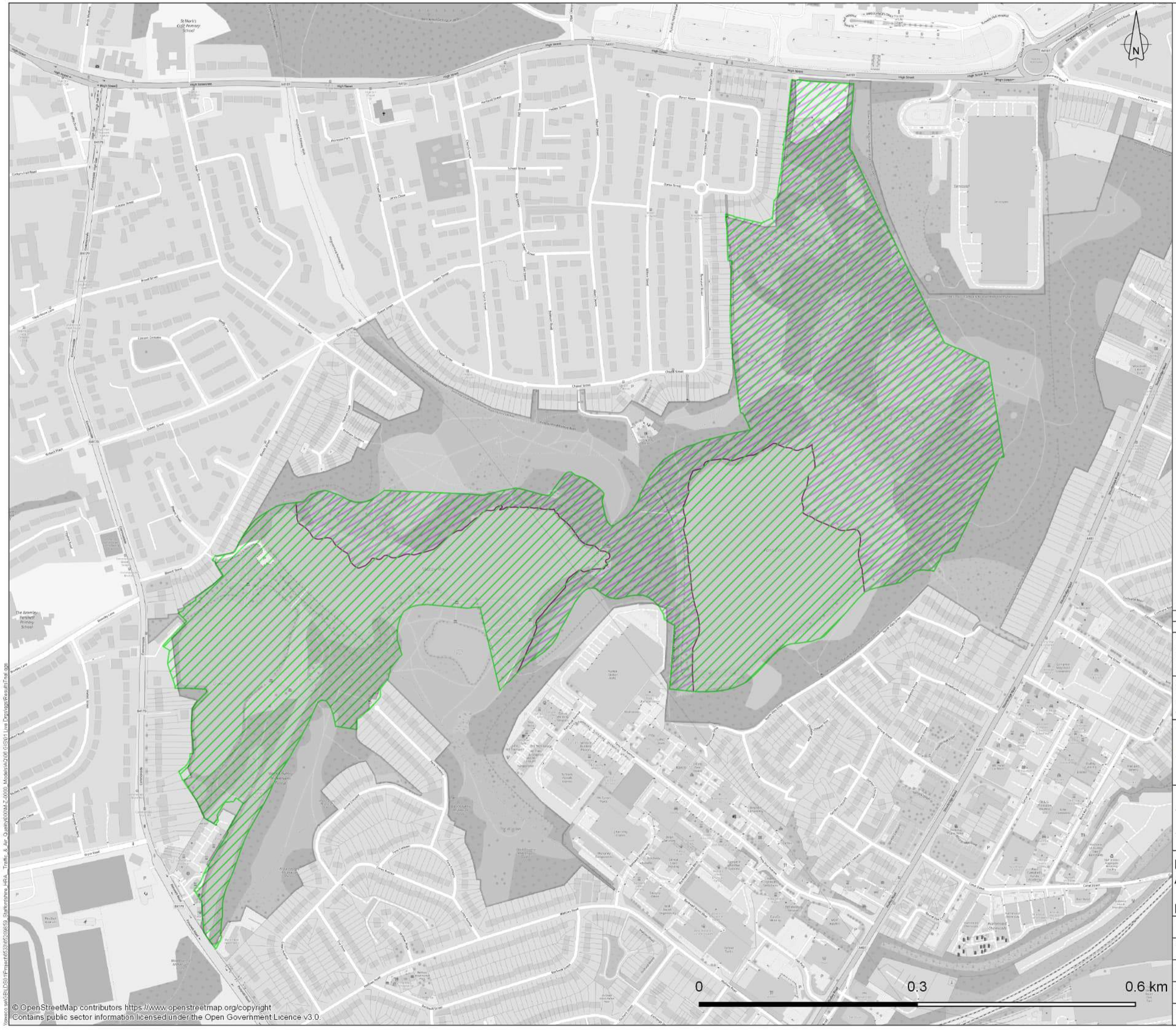

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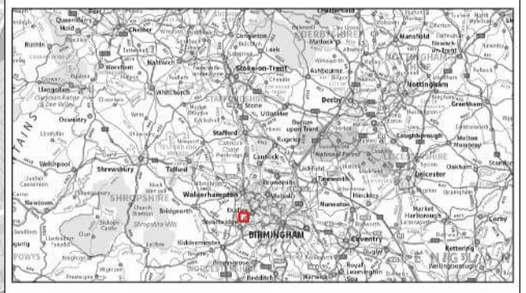
Designated Nature Conservation Sites

- Site of Special Scientific Interest (SSSI)
- Special Area of Conservation (SAC)



Rev	Date	Amendment Details	Dr'n	Chk'	App'
Rev	06.11.2024	FIRST ISSUE	ABC	ABC	ABC

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Project Title

Assessment of Air Quality Impacts on European Sites in Staffordshire, Wolverhampton, Walsall, Sandwell, and Dudley

Drawing Title

Figure 1.3 Location of European sites included in the Air Quality Assessment to inform the HRA

Fens Pools SAC/SSSI

Project Stage			
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Sheet Size: A3	Scale: 1:5,000	Sweco Ref: 65209859	Revision: P01.1
Drawing Number: 65209859-SWE-XX-XX-D-AQ-0001			

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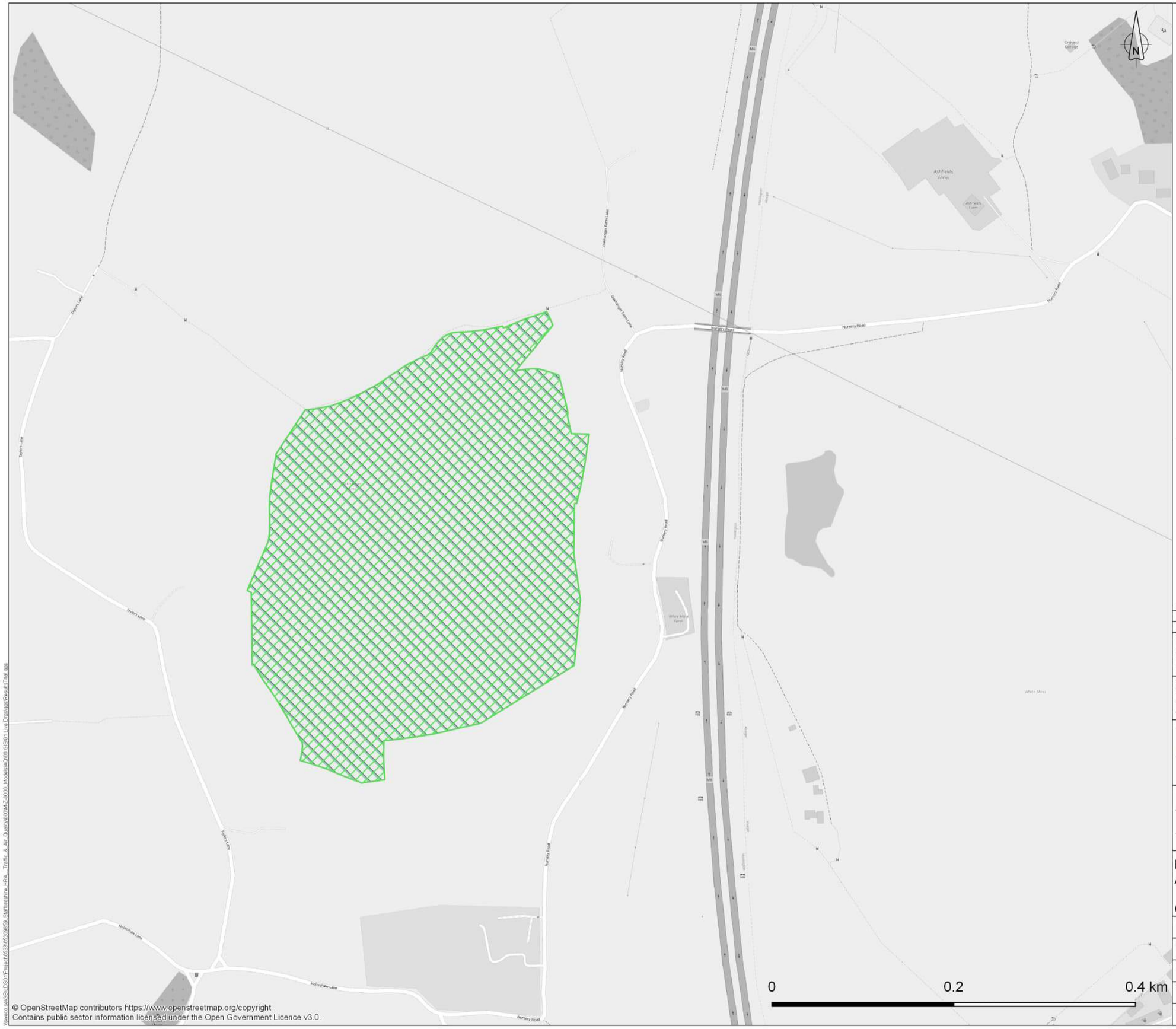

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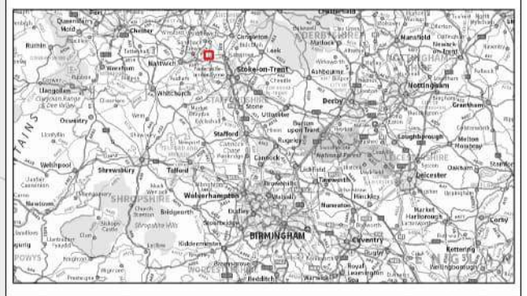
Designated Nature Conservation Sites

- Site of Special Scientific Interest (SSSI)
- Wetland of International Importance (Ramsar)



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Project Title

Assessment of Air Quality Impacts on European Sites in Staffordshire, Wolverhampton, Walsall, Sandwell, and Dudley

Drawing Title

Figure 1.4 Location of European sites included in the Air Quality Assessment to inform the HRA

Oakhanger Moss SSSI (Ramsar)

Project Stage			
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Status: n/a	Status Description: n/a		
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Sheet Size: A3	Scale: 1:4,000	Sweco Ref: 65209859	Revision: P01.1
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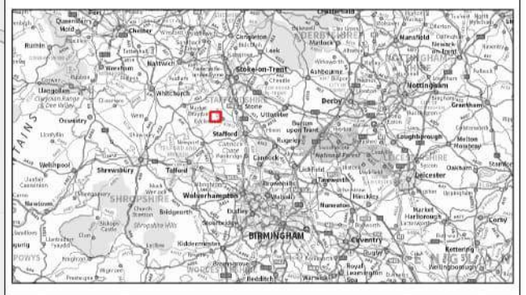
Designated Nature Conservation Sites

- Site of Special Scientific Interest (SSSI)
- Wetland of International Importance (Ramsar)



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Client: South Staffordshire Council

Project Title:
Assessment of Air Quality Impacts on European Sites in Staffordshire, Wolverhampton, Walsall, Sandwell, and Dudley

Drawing Title:
Figure 1.5 Location of European sites included in the Air Quality Assessment to inform the HRA

Cop Mere SSSI (Ramsar)

Project Stage	Status	Status Description
n/a	n/a	n/a

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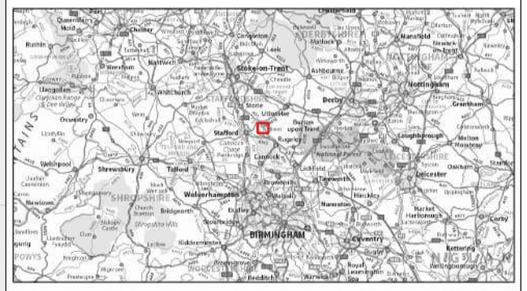
Legend

Designated Nature Conservation Sites

- Site of Special Scientific Interest (SSSI)
- Special Area of Conservation (SAC)



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Client: South Staffordshire Council

Project Title: Assessment of Air Quality Impacts on European Sites in Staffordshire, Wolverhampton, Walsall, Sandwell, and Dudley

Drawing Title: Figure 1.6 Location of European sites included in the Air Quality Assessment to inform the HRA

Pasturefields Salt Marsh SAC/SSSI

Project Stage			
n/a			
Status: n/a	Status Description: n/a		
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2 Legislation & National Planning Policy

This section provides a summary of the pertinent legislation and planning policies that apply to this assessment.

2.1 Legislation

2.1.1 The Conservation of Habitats and Species Regulations 2017 (as amended)

The *Conservation of Habitats and Species Regulations 2017* (as amended) ('Habitats Regulations'); Regulation 63 (1) states that:

'*A competent authority, before deciding to undertake, or give any consent, permission or other authorisation for, a plan or project which –*

(a) is likely to have a significant effect on a European site or a European offshore marine site (either alone or in-combination with other plans or projects), and

(b) is not directly connected with or necessary to the management of that site,

– must make an Appropriate Assessment of the implications for that site in view of that site's conservation objective.'

The Habitats Regulations also make allowance for projects or plans to be completed if they satisfy '*imperative reasons of overriding public interest (IROPI)*'. Regulations 64 and 68 apply in this regard.

2.1.2 National Air Quality Legislation

The *European Directive on Ambient Air Quality* (2008/50/EC) set legally binding limits (termed 'critical levels') for ambient concentrations of air pollutants that impact ecosystems, such as oxides of nitrogen (NO_x). Critical levels are concentrations of pollutants (e.g. in micrograms per cubic metre, µg/m^3) in the atmosphere below which direct adverse effects on receptors, such as human beings, plants, ecosystems or materials, are not expected to occur according to present knowledge.

The Directive and associated pollutant critical levels and limit values were transposed into UK law under the Air *Quality Standards Regulations 2010* (as amended) and, following the UK's exit from the EU, the *Environment (Legislative Functions from Directives) (EU Exit) Regulations 2019*.

The UK's Air Quality Strategy, published in July 2007 was superseded in England by the 2023 Air Quality Strategy[4] and fulfils the statutory requirement of the *Environment Act 1995* as amended by the *Environment Act 2021* to publish an Air Quality Strategy setting out air quality standards, objectives, and measures for improving ambient air quality every 5 years.

The Strategy establishes the framework for air quality improvements across the UK and sets out standards for key air pollutants that reflect levels of pollutants thought to avoid or minimise risks to health or ecosystems. The associated air quality objectives are policy targets, expressed as maximum permissible outdoor concentrations of pollutants that take account of economic efficiency, practicability, technical feasibility and timescales.

The Strategy reinforces the annual mean critical level for NO_x, as presented in **Table 1** below. It also acknowledges the potential for significant impacts associated with levels of NH_3, with both

[4] Department for Environment Food & Rural Affairs (Defra) *Air quality strategy: framework for local authority delivery 2023*

pollutants contributing to the deposition of reactive nitrogen and "…*the associated long-term decline of biodiversity in the UK*".

Whilst not explicitly provided in the Air Quality Strategy, critical levels for NH_3 are assigned for all vegetation types and established by the *Working Group on Effects of the UNECE Convention on Long Range Transboundary Air Pollution*[5]. The respective annual mean NH_3 critical level concentrations applicable to lower (lichens and bryophytes) and higher plants are provided in **Table 1**.

Similar benchmarks apply to nitrogen and acid deposition, termed as 'critical loads'. Critical loads define the rates of acid or nitrogen (N) deposition (e.g. in kiloequivalents per hectare per year, keq/ha/yr) below which significant harmful effects are not expected to occur in sensitive habitats. Critical loads for N deposition are set under the *Convention on Long Range Transboundary Air Pollution*[5], with critical loads for acidity derived using differing methods for terrestrial habitats and freshwater ecosystems[6]. Critical loads for both N and acid deposition are dependent on the specific habitat type, with N deposition critical loads given as ranges. The critical loads applicable to the European sites included in this assessment are presented in **Section 4**.

Table 1: Annual mean NO_x and NH_3 critical levels applicable to this assessment

Pollutant	Critical Level	Measured as	Applicable to
Oxides of Nitrogen, NO_x	30 µg/m^3	Annual Mean	Protection of vegetation and ecosystems
Ammonia, NH_3	3 µg/m^3	Annual Mean	Higher plants
Ammonia, NH_3	1 µg/m^3	Annual Mean	Lower plants (lichens & bryophytes)

2.2 National Planning Policy Context

The Government's overall planning policies for England are described in the National Planning Policy Framework[7]. The core underpinning principle of the Framework is the presumption in favour of sustainable development, which for 'plan-making' means that:

"…

a) *all plans should promote a sustainable pattern of development that seeks to: meet the development needs of their area; align growth and infrastructure; improve the environment; mitigate climate change (including by making effective use of land in urban areas) and adapt to its effects;*
b) *strategic policies should, as a minimum, provide for objectively assessed needs for housing and other uses, as well as any needs that cannot be met within neighbouring areas, unless:*
    i. the application of policies in this Framework that protect areas or assets of particular importance [including habitats sites] *provides a strong reason for restricting the overall scale, type or distribution of development in the plan area; or*

[5] United Nations Economic Commission for Europe (13 November 1979) *Convention on long-range transboundary air pollution*
[6] UK Centre for Ecology and Hydrology - Air Pollution Information System webpage: https://www.apis.ac.uk/critical-loads-and-critical-levels-guide-data-provided-apis#_Toc279788050 (accessed June 2024)
[7] Ministry of Housing, Communities & Local Government (December 2023) *National Planning Policy Framework*

ii. any adverse impacts of doing so would significantly and demonstrably outweigh the benefits, when assessed against the policies in this Framework taken as a whole..."

Paragraph 181 of the NPPF states, in relation to conserving and enhancing the natural environment, that "…*Plans should: distinguish between the hierarchy of international, national and locally designated sites; allocate land with the least environmental or amenity value, where consistent with other policies in this Framework; take a strategic approach to maintaining and enhancing networks of habitats and green infrastructure; and plan for the enhancement of natural capital at a catchment or landscape scale across local authority boundaries*…".

In relation to the above and specifically with regard to air quality, paragraph 180 states that "…*Planning policies and decisions should contribute to and enhance the natural and local environment by…e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality*…".

Notwithstanding, paragraph 188 of the NPPF asserts that "…*the presumption in favour of sustainable development does not apply where the plan or project is likely to have a significant effect on a habitats site (either alone or in-combination with other plans or projects), unless an appropriate assessment has concluded that the plan or project will not adversely affect the integrity of the habitats site*".

For the purposes of this report, all relevant habitats sites as described above are collectively termed 'European sites'.

2.3 The Wealden Judgement

The Wealden Judgement[8], handed down in March 2017, introduced additional complexities into the HRA process in relation to in-combination and cumulative effects.

Prior to this Judgement, it was deemed that air quality impacts on European sites need only be considered alongside roads where the traffic growth associated with the individual Plan or Project being assessed exceeded specified screening criteria. These criteria were typically based on changes in vehicle movements and taken from the Design Manual for Roads and Bridges (DMRB, LA105)[9], equating to:

- Increases of over 1,000 domestic vehicles per day or 200 Heavy Goods Vehicles per day (as Annual Average Daily Traffic (AADT)).

The Wealden Judgement found that the application of the criteria to the traffic growth associated with a single Local Plan was unsound on the basis that two Local Plans collectively contributing more than 1,000 domestic AADT could lead to a potentially significant effect. The Judge determined that further assessment of air quality impacts on European sites should have been carried out and quashed part of the Local Plan that would have led to an in-combination exceedance of 1,000 domestic AADT.

This judgement poses several challenges for Local Authorities and Council Officers, namely:

- Uncertainty – at present, there is no widely accepted approach to the appropriate use of screening criteria and when these may be used to rule out the need for detailed modelling of potential air quality impacts. Natural England has published guidance which

[8] Judgment in Wealden District Council v. Secretary of State for Communities and Local Government, Lewes District Council and South Downs National Park Authority [2017] EWHC 351 (Admin) DATE: 21 Mar 2017.
[9] National Highways (2024) *Design Manual for Roads and Bridges LA105 Air Quality v0.1.0*

provides a staged approach for assessing in-combination effects. This methodology has been used as the basis for this air quality assessment, as outlined herein.

- Lack of a clear '*de minimus*' – there is case law that supports the use of *de minimus* thresholds in the assessment of potential impacts on European sites, i.e. where no 'appreciable effect' may occur[10] as the result of a Plan or Project. Some practitioners have argued that Wealden suggests there is no *de minimus* threshold for increases in traffic emissions, and a development leading to an increase of even one vehicle per day should be prohibited or subject to further assessment for in-combination traffic growth, whilst others have argued that the Wealden Judgement applies to the use of traffic thresholds alone.
- Difficulties devising and delivering local planning policy – where predicted Local Plan growth will result in increased vehicle emissions, it is more challenging to determine the appropriate scope of traffic modelling, air quality modelling and HRA work required in support.
- Difficulties assessing individual planning applications – how do Local Authorities determine planning applications that will increase vehicle movements in proximity to European sites whilst tracking cumulative growth.

[10] Sweetman v. An Bord Pleanála, Case C-258/11, CJEU judgment 11 April 2013

3 Scope & Methodology

This section provides details of the data and information supplied for the purpose of undertaking the air quality assessment. It also describes the adopted methodology for assessing and appraising the potential 'in-combination' air quality impacts associated with the Partnership Authorities' emerging Local Plans, which aligns with the Middlemarch Environmental Ltd brief[1], as agreed with Natural England[2].

3.1 Key Data & Resources

An index of the key data and resources used within this study and the respective sources are presented in **Table 2**.

Table 2: Key data and resources relating to air quality assessment

Data / Information	Description	Source / Document Reference
European site boundaries	Georeferenced shapefiles for each relevant European site were sourced from the Joint Nature Conservation Committee (JNCC), such that they could be accurately represented in the air quality model.	JNCC https://jncc.gov.uk/our-work/uk-protected-area-datasets-for-download/
Nitrogen dioxide (NO_2) and NH_3 monitoring data specific to project	Monitoring data (2022-23) at or near to relevant European sites were provided by Stafford Borough Council to inform the assessment of baseline air quality conditions.	Stafford Borough Council
NO_2 monitoring data from Partnership Authorities	To facilitate verification of the air quality model, local authority data pertaining to roadside annual mean NO_2 concentrations were sourced for relevant locations within the study area.	Various air quality Annual Status Reports (ASRs) published by the individual Partnership Authorities
N and acid deposition rates and critical loads	Respective baseline N deposition and acid deposition rates and empirical habitat critical loads	Middlemarch Environmental Ltd[1] and Air Pollution Information System (APIS) Website (http://www.apis.ac.uk/)
Defra national background pollutant mapping data (2018-based)	Background 1km x 1km grid pollutant data obtained for the respective grid squares encompassing the study area.	Annual mean data sourced from Defra: https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018
Defra EFT v12.0	Vehicle emissions factors toolkit allowing calculation of road link-based pollutant emissions rates (e.g. NO_x) for a specified year, road type, vehicle speed and vehicle fleet composition	https://laqm.defra.gov.uk/air-quality/air-quality-assessment/emissions-factors-toolkit/
Defra Local Air Quality Management (LAQM) Tools	A suite of tools to enable collation of vehicle emissions inventory data and conversion of NO_x to NO_2.	All LAQM tools sourced from Defra: https://laqm.defra.gov.uk/review-and-assessment/tools/tools.html
National Highways NH_3 Emissions from Vehicles Tool v4	A calculator tool that enables the derivation of road-NH_3 concentrations at a specified receptor based on a relationship between NO_x and NH_3 vehicle emissions for both light duty and heavy duty vehicles.	National Highways (Jan 2024) *Draft - Highways England Ammonia N Deposition Tool_v4*
Atmospheric Dispersion Modelling System for Roads v5.0.1 (ADMS-Roads)	Steady-state dispersion model capable of predicting dispersion of emissions from the assessed road network and calculating pollutant concentrations at receptors.	Cambridge Environmental Research Consultants (CERC)

Data / Information	Description	Source / Document Reference
Baseline and future year traffic data for all model scenarios	Traffic data provided in appropriate format to enable air pollutant emissions inventory (NO_x) databases to be generated prior to dispersion modelling,	Data supplied by project transport consultant (Sweco). Link-based traffic data applicable to the study area are provided in **Appendix A**.
Hourly sequential meteorological data	Data representative of study area obtained for year 2022 to align with model verification year and to facilitate dispersion modelling.	Formatted National Weather Prediction (NWP) hourly data suitable for use in ADMS 6 purchased from ADM Ltd
LAQM Technical Air Quality Guidance	Guidance document, including information on dispersion modelling and model verification / adjustment	Defra (2022) *Local Air Quality Management Technical Guidance*[11] (referred to as 'LAQM.TG22')
Natural England Guidance	Natural England guidance on assessment of road traffic emissions under the Habitats Regulations	*Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations*[12]
Institute of Air Quality Management (IAQM) Guidance	Guidance document for assessing the air quality impact on designated sites	IAQM (2019) *A Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites*[13]
Ordnance Survey (OS) MasterMap	Base mapping covering the model domain to facilitate model build of road network and accurate representation of modelled receptors.	OS MasterMap provided by Partnership Authorities under licence agreement (2023)
Terrain data	Light Detection and Ranging (LIDAR) data used at 2 m resolution was used to facilitate inclusion of terrain elevations within dispersion model.	Environment Agency LIDAR Composite Digital Terrain Model (DTM) elevation data (2022) https://environment.data.gov.uk/survey

3.2 Natural England's Guidance

In June 2018, Natural England published guidance[12] on their approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations. The document considers the Wealden Judgement and the need to assess in-combination effects on European sites as a result of air pollution.

The guidance provides a framework around the assessment of road traffic emissions and subsequent effects on International Sites. Notably:

- Step 1 – Does the proposal give rise to emissions which are likely to reach a Habitats Site.
- Step 2 – Are there qualifying features within 200 m of a road sensitive to air pollution.
- Step 3 – Could the sensitive qualifying features of the site be exposed to emissions.
- Step 4 – Application of the Screening Thresholds.
  - Step 4a: apply the threshold alone.
  - Step 4b: apply the threshold in-combination with emissions from other road traffic plans and projects.

[11] Defra (2022) *Local Air Quality Management Technical Guidance LAQM.TG22*

[12] Natural England (June 2018) *Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations*

[13] IAQM (2019) *A Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites. Version 1.0*

- Step 4c: apply the threshold in-combination with emissions from other non-road plans and projects.
- Step 5: Advise on the need for Appropriate Assessment where thresholds are exceeded, either alone or in-combination.

The relevant thresholds in relation to Step 4 are as follows:

- Changes in AADT of 1,000 domestic vehicles a day (or more); and/or
- Changes of 1% of the relevant Critical Load and/or Level as a result of the Plan/Project.

The guidance does not specifically cover nationally significant sites such as Sites of Special Scientific Interest (SSSIs), which are covered by a different regulatory framework. However, it does state that the general principles for air quality assessment outlined for European sites are likely to be equally relevant for this and other designations.

The above guidance has been referenced throughout the completion of this air quality assessment, particularly with respect to the scenarios addressed. However, this assessment focusses on the in-combination impacts associated with the Partnership Authorities' emerging Local Plans and does not consider the individual 'alone' impact associated with each discrete Local Plan. This is consistent with the methodology agreed with Natural England[1,2].

3.3 Assessment Methodology

3.3.1 Study Area

The study area for the air quality assessment was determined through identifying the road links within 200 m of the relevant European sites as listed in **Section 1.1** and depicted in **Figure 1**. Primarily, the road links within 200 m encompassed the 'road assessment point' (RAP) locations identified by the Middlemarch brief[1], as presented in **Table 3**.

The full extent of the modelled road links and RAP locations within 200 m of each European site are depicted on **Figure 2**.

Table 3: RAP locations used to identify the key roads within 200 m of European sites

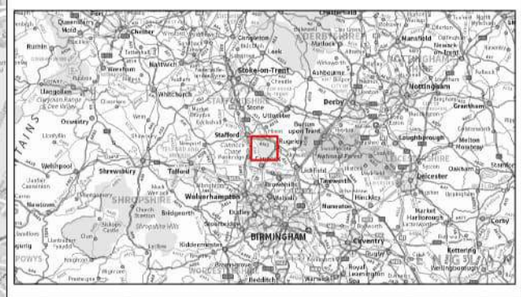
European Site	Land Parcel	Road Type	Road Name	OS Grid Reference	RAP Reference
Cannock Chase SAC	N/A	A	A513	397865, 320796	RAP 1
		A	A460 Rugeley Road	402164, 314732	RAP 2
		Unclassified	Camp Road	397719, 317062	RAP 3
Pasturefields Salt Marsh SAC	N/A	A	A51	399447, 324872	RAP 4
Midlands Meres and Mosses Phase 2 Ramsar	Cop Mere	Unclassified	Unnamed	380412, 329409	RAP 8
	Oakhanger Moss	Motorway	M6	377104, 355061	RAP 25
Cannock Extension Canal SAC	N/A	A	A5 Watling Street	402030, 306921	RAP 10
		B	B4154 Lime Lane	402006, 306291	RAP 11
Fens Pools SAC	N/A	A	A4101 High Street	392072, 289236	RAP 12
		A	A461 Stourbridge Road	392409, 288620	RAP 13

Legend

- Modelled Roads (HRA)
- RAP Locations
- Modelled Receptor Points

Designated Nature Conservation Sites

- Site of Special Scientific Interest (SSSI)
- Special Area of Conservation (SAC)



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Project Title: Assessment of Air Quality Impacts on European Sites in Staffordshire, Wolverhampton, Walsall, Sandwell, and Dudley

Drawing Title: Figure 2.1 Road links within 200 m of each European site included in assessment

Cannock Chase SAC/SSSI

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RAP 10

RAP 11

Cannock Extension Canal SSSI

Cannock Extension Canal SAC

0 0.3 0.6 km

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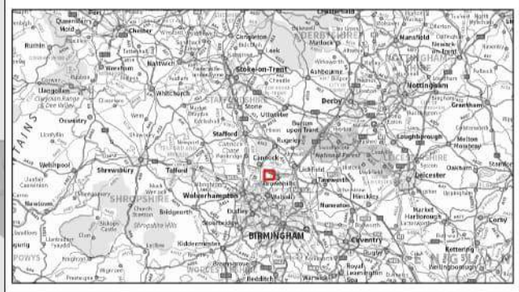
Legend

- Modelled Roads (HRA)
- RAP Locations
- Modelled Receptor Points

Designated Nature Conservation Sites

- Site of Special Scientific Interest (SSSI)
- Special Area of Conservation (SAC)



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Project Title

Assessment of Air Quality Impacts on European Sites in Staffordshire, Wolverhampton, Walsall, Sandwell, and Dudley

Drawing Title

Figure 2.2 Road links within 200 m of each European site included in assessment

Cannock Extension Canal SAC/SSSI

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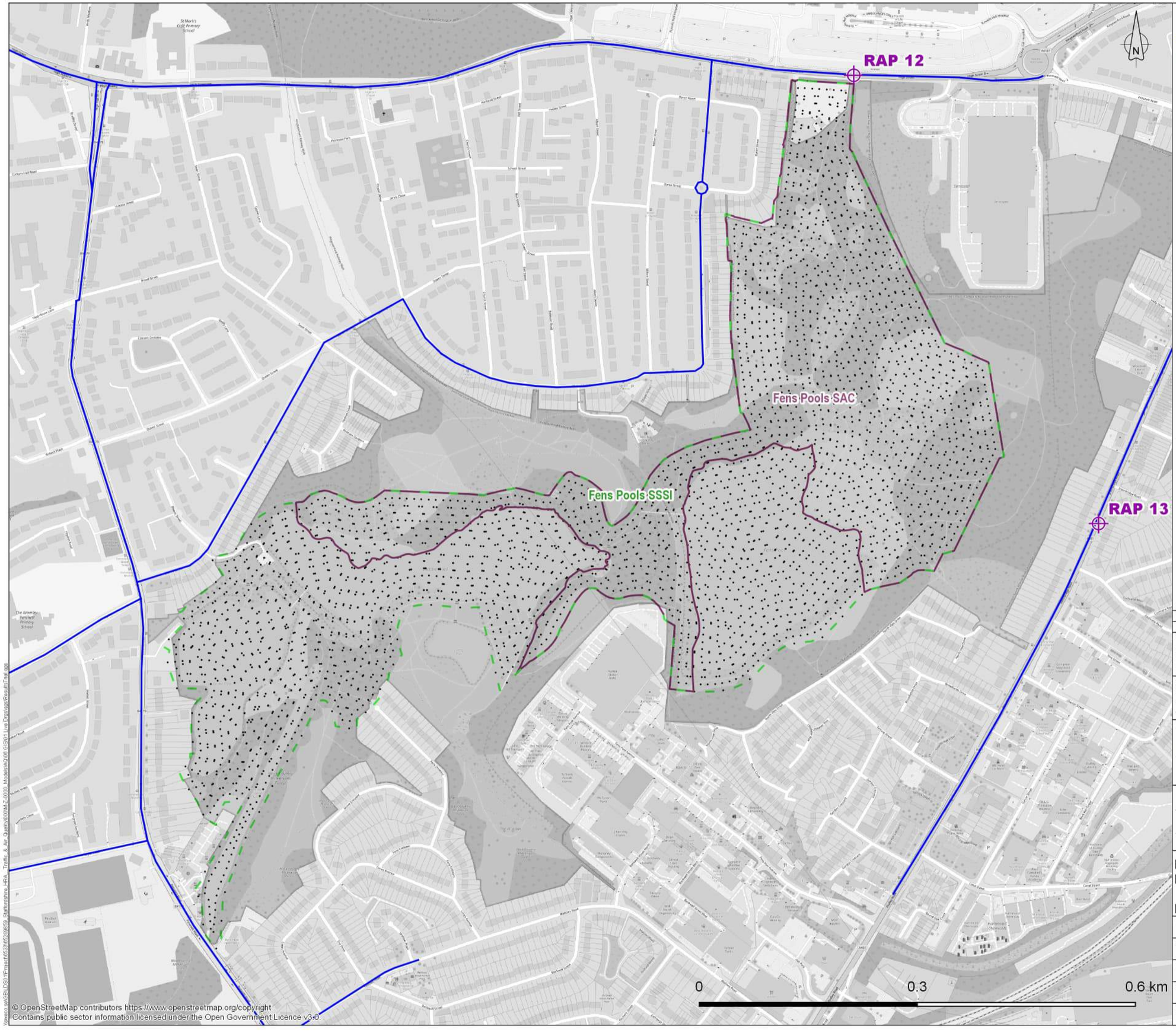
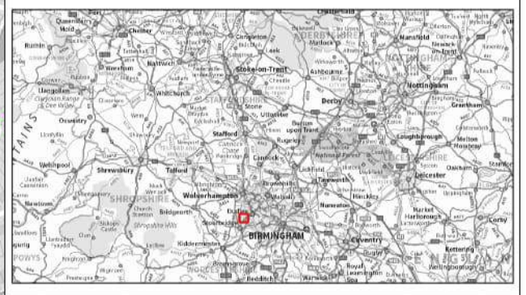


Legend

- Modelled Roads (HRA)
- RAP Locations
- Modelled Receptor Points

Designated Nature Conservation Sites

- Site of Special Scientific Interest (SSSI)
- Special Area of Conservation (SAC)



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Drawing Title

Figure 2.3 Road links within 200 m of each European site included in assessment

Fens Pools SAC/SSSI

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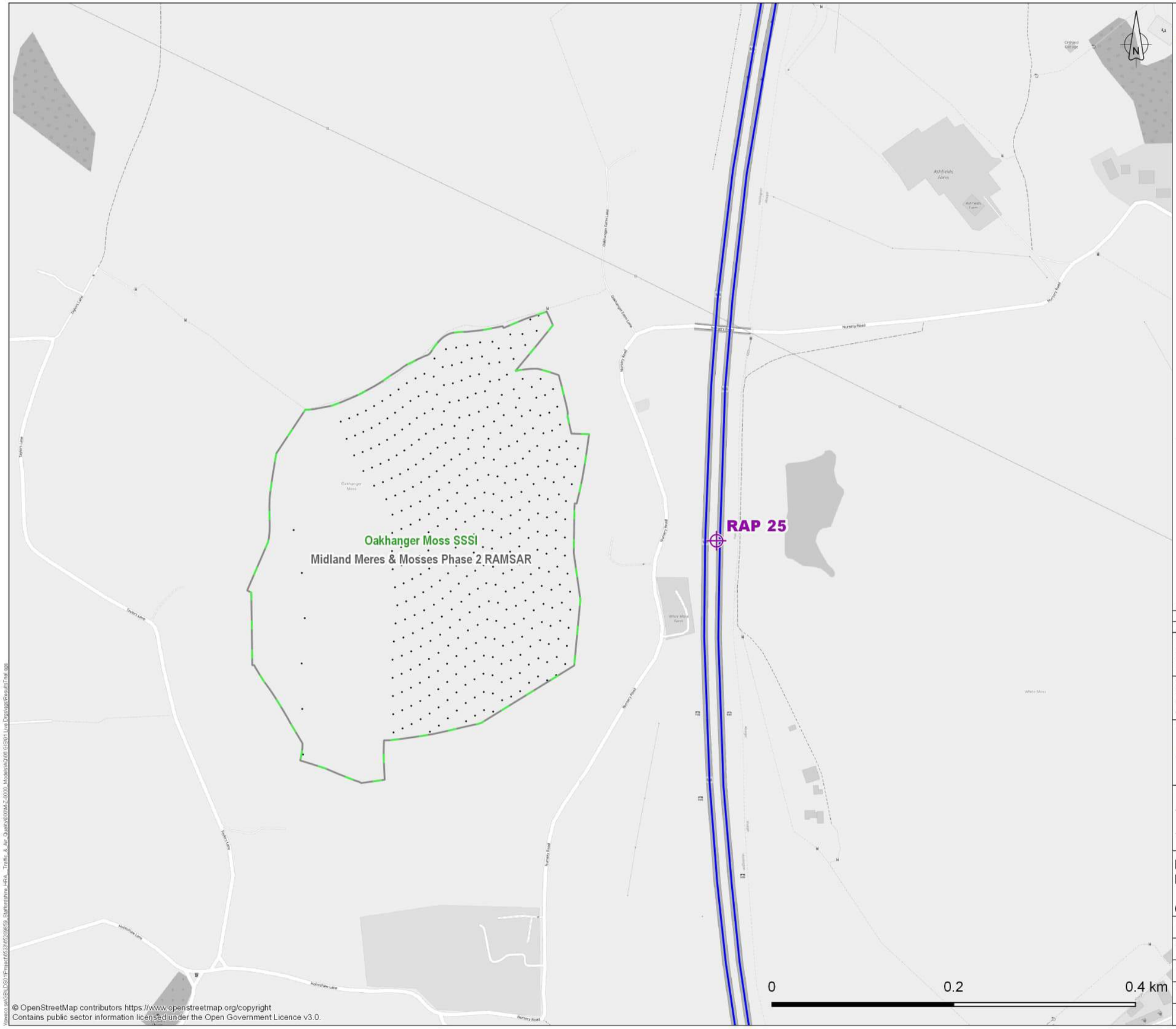
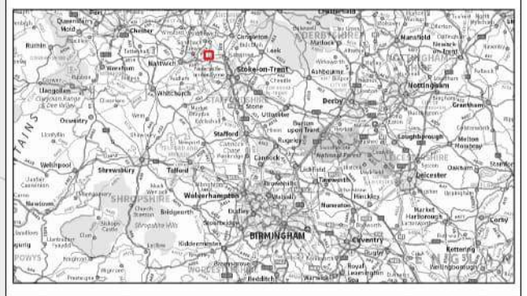


Legend

- Modelled Roads (HRA)
- RAP Locations
- Modelled Receptor Points

Designated Nature Conservation Sites

- Site of Special Scientific Interest (SSSI)
- Wetland of International Importance (Ramsar)



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Drawing Title

Figure 2.4 Road links within 200 m of each European site included in assessment

Oakhanger Moss SSSI (Ramsar)

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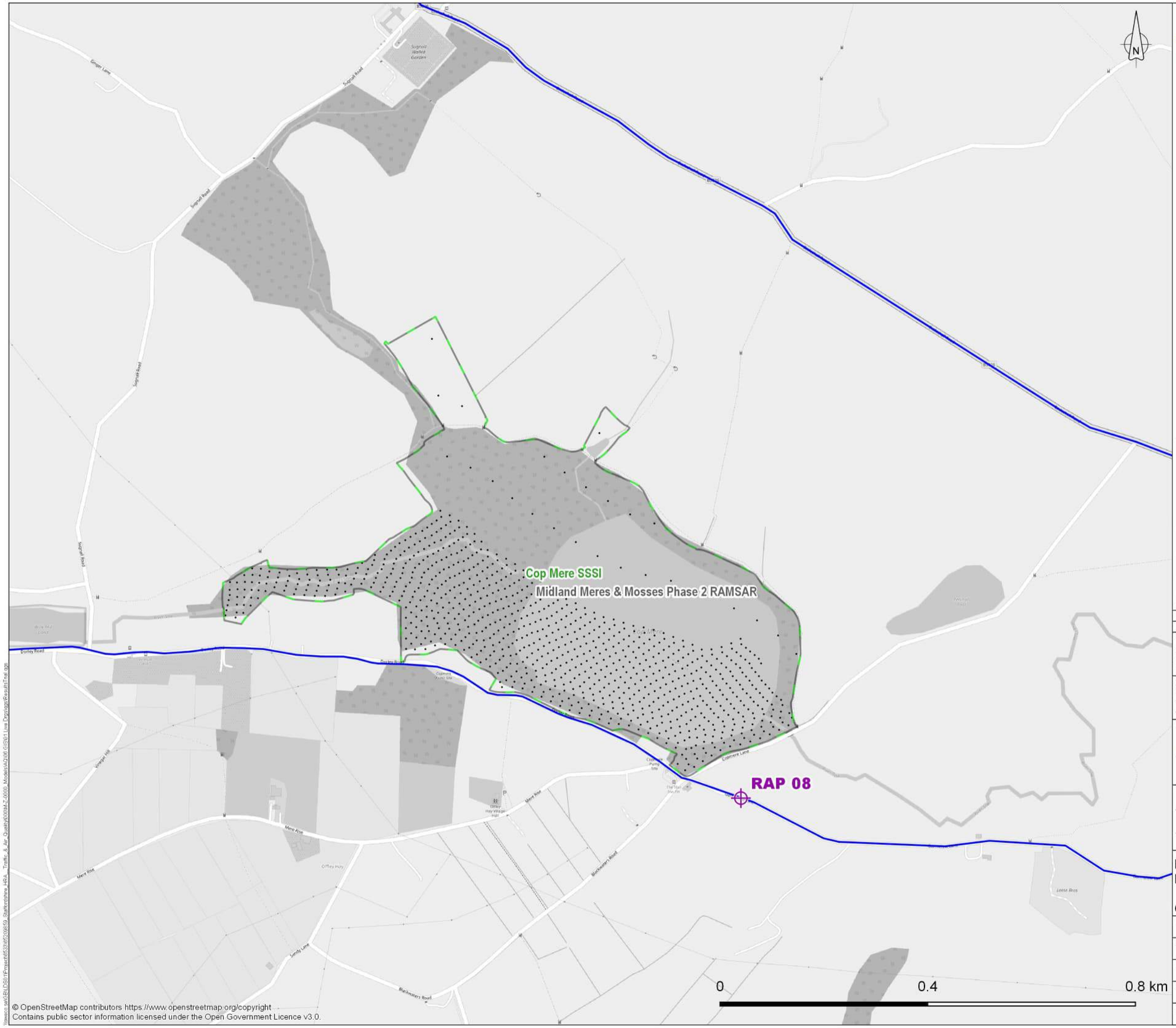

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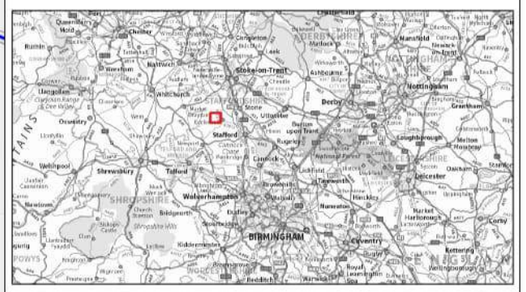
Legend

- Modelled Roads (HRA)
- RAP Locations
- Modelled Receptor Points

Designated Nature Conservation Sites

- Site of Special Scientific Interest (SSSI)
- Wetland of International Importance (Ramsar)



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South Staffordshire Council

Project Title

Assessment of Air Quality Impacts on European Sites in Staffordshire, Wolverhampton, Walsall, Sandwell, and Dudley

Drawing Title

Figure 2.5 Road links within 200 m of each European site included in assessment

Cop Mere SSSI (Ramsar)

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Status: n/a	Status Description: n/a		
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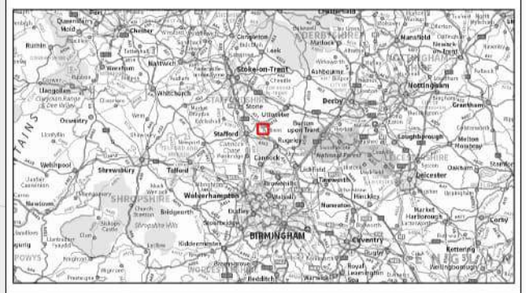
Legend

- Modelled Roads (HRA)
- RAP Locations
- Modelled Receptor Points

Designated Nature Conservation Sites

- Site of Special Scientific Interest (SSSI)
- Special Area of Conservation (SAC)



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Project Title: Assessment of Air Quality Impacts on European Sites in Staffordshire, Wolverhampton, Walsall, Sandwell, and Dudley

Drawing Title: Figure 2.6 Road links within 200 m of each European site included in assessment

Pasturefields Salt Marsh SAC/SSSI

Project Stage: n/a			
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Receptor Selection

The modelled road network was used to determine where discrete receptors would be modelled within each assessed European site, in addition to assigning a receptor grid across each site to encompass a distance up to 1 km from the nearest road(s). These receptors represent the discrete points at which concentrations and deposition rates were modelled as part of the dispersion modelling study (see **Section 3.3.2**).

Where a road link was within 200 m of a European site, discrete receptors were modelled at 10 m intervals along the respective European site boundary and at 10 m intervals up to a distance of 200 m within the respective European site. This ensured detailed coverage of the main areas of interest within the designated sites that are closest to the RAP road links.

In some cases, where the scale of the European site allowed, additional receptors were added beyond the 200 m distance at larger intervals to facilitate the creation of concentration / deposition rate contour plots. These comprised rows of receptors perpendicular to the European site boundary at 50 m intervals, with each row separated by 100 m up to a maximum of 1 km from the boundary.

The modelled receptors within each European site are depicted in **Figure 2**.

3.3.2 Atmospheric Dispersion Modelling

Model Scenarios

The air quality modelling focussed on the following scenarios, for which traffic data were provided by the appointed transport consultant (Sweco UK Ltd)[3] to facilitate dispersion modelling of vehicle emissions using CERC's ADMS-Roads v5.0.1 model:

- **2022 Baseline & Model Verification**
    - Baseline traffic data were provided for all RAP road links, in addition to an extended road network to capture relevant local authority air quality monitoring locations that were used as part of the model verification exercise (see 'Model Verification' below).
- **2042 Alternative Future Baseline**
    - Using 2022 Baseline traffic data, future year vehicle fleet breakdown and future year vehicle emissions factors, this scenario conservatively assumes no growth in traffic from 2022 to 2042, whilst allowing the future decline in exhaust emissions of NO_x to be represented.
    - This scenario aligns with paragraph 5.4.1.10 of the IAQM guidance[13] with respect to facilitating the calculation of in-combination impacts.
- **2042 With Partnership Local Plans**
    - Using future year vehicle fleet breakdown and future year vehicle emissions factors.
    - Comprising all traffic growth since 2022 associated with adopted and emerging Local Plans for South Staffordshire District, East Staffordshire Borough, Lichfield District, Cannock Chase District, City of Wolverhampton, and Sandwell Metropolitan Borough councils.

- Including background traffic growth[14] for Partnership Authorities where no Local Plan data were available at the time of assessment[15] and for growth contributed by local authorities outside of the Partnership Authorities.

Traffic data were provided as 24-hour AADT flows, with associated percentage of HDV flows, and vehicle speeds (km/h) applicable to the modelled road links in each model scenario. These data are presented in **Appendix A**.

The focus of this assessment is on the in-combination impacts on the relevant European sites from the traffic growth associated with the Partnership Authorities emerging Local Plans. As such, the screening of traffic data to determine which RAP road links exceeded the criteria stipulated by Natural England guidance[12] (see **Section 3.3**) was based on the difference in traffic flows between the ***2042 Alternative Future Baseline*** and the ***2042 With Partnership Authorities Local Plans***. This determined the in-combination traffic impact on each RAP link.

Vehicle Emissions Inventories

The traffic data were used to develop road-NO_x emissions inventory databases for each scenario using Defra's EFT version 12.0. Vehicle emissions factors are provided by EFT v12.0 up to year 2050. However, the associated LAQM tools (i.e. background pollutant maps and NO_x to NO_2 calculator) currently support assessment years up to 2030 only. Therefore, to provide a conservative assessment and minimise limitations, vehicle emissions factors for year 2030 were used for both future year (2042) scenarios.

The emissions inventories accounted for the traffic flow characteristics, including:

- Road type (e.g. urban, rural, motorway)
- Total vehicle flow by link (AADT)
- Percentage of HDVs per link
- Average link speed (km/h)
- A detailed vehicle fleet breakdown derived for the future year (2042) scenarios using national vehicle fleet projections from a base year of 2022[16].

The emissions database outputs for each respective scenario provided road link-specific pollutant emission rates (g/km/s), which were input to the ADMS-Roads model to enable prediction of road-NO_x concentrations at the modelled receptor locations.

Meteorological Data

There were no representative weather monitoring stations within 45 km of the study area. Given the spatial extent of the model area, formatted Numerical Weather Prediction (NWP) data for year 2022 were sourced for a 3 km x 3 km area centred on the former RAF Wheaton airfield. This represented an area of flat terrain, predominantly comprising open fields. As such, the NWP data are not likely to be significantly influenced by urban development or other pronounced topographical features.

[14] Using the Trip End Model Presentation Program (TEMPro) software to view National Trip End Model (NTEM) information.

[15] The transport modelling completed by Sweco UK Ltd[3] excluded emerging Local Plans for Dudley and Walsall Metropolitan Borough Councils due to the absence of data provision at the time of completing the transport modelling assessment.

[16] Vehicle fleet projections (Base 2022) sourced from the National Atmospheric Emissions Inventory (NAEI); https://naei.beis.gov.uk/data/ef-transport (accessed March 2024). These align with the default fleet composition data incorporated in Defra's EFT v12.0.

A wind rose depicting the hourly wind speeds and directions for 2022 is presented in **Appendix B**.

Treatment of Terrain

Terrain datasets were used in the model both to represent the variation in topography throughout the study area and to determine road gradients where appropriate.

The Environment Agency's LIDAR DTM elevation data at 2 m resolution were sourced for use in the ADMS-Roads model. The data were input to the model, which uses the spatial variation in terrain height and surface roughness, combined with local meteorological conditions, to predict a three-dimensional flow and turbulence field over the study area. This enables the model to account for the influence of undulating terrain on wind flow and turbulence, with respect to the dispersion of vehicle emissions.

Background Concentrations & Deposition

Background air pollutant (NO_x, NO_2) concentrations for the baseline year (2022) and future year (2030 as proxy for 2042) were obtained from Defra's national pollutant mapping for the corresponding 1 km^2 grid squares covering the study area.

The equivalent background NH_3 concentrations and rates of N deposition and acid deposition corresponding to the relevant European sites were sourced from site-specific data available from APIS, which provides modelled three year average data across the UK (1 km^2 grid). At the time of completing this assessment, the three year averaged data were based on 2019-2021, with 2020 being the midyear.

Background NH_3 concentrations and N deposition rates for the future year (2042) scenarios were adjusted with reference to JNCC's Nitrogen Futures report (2020)[17], based on projections of NH_3 and NO_x emissions up to 2030. Nationally, emissions of NH_3 are predicted to increase by 1.06% between 2017 and 2030 based on a relatively conservative 'business as usual' scenario[17], equating to a change of 0.08% per annum over this period. However, N deposition rates are projected to decrease by 13.57% over the same period (-1.04% per annum), owing to the greater projected reduction in NO_x emissions.

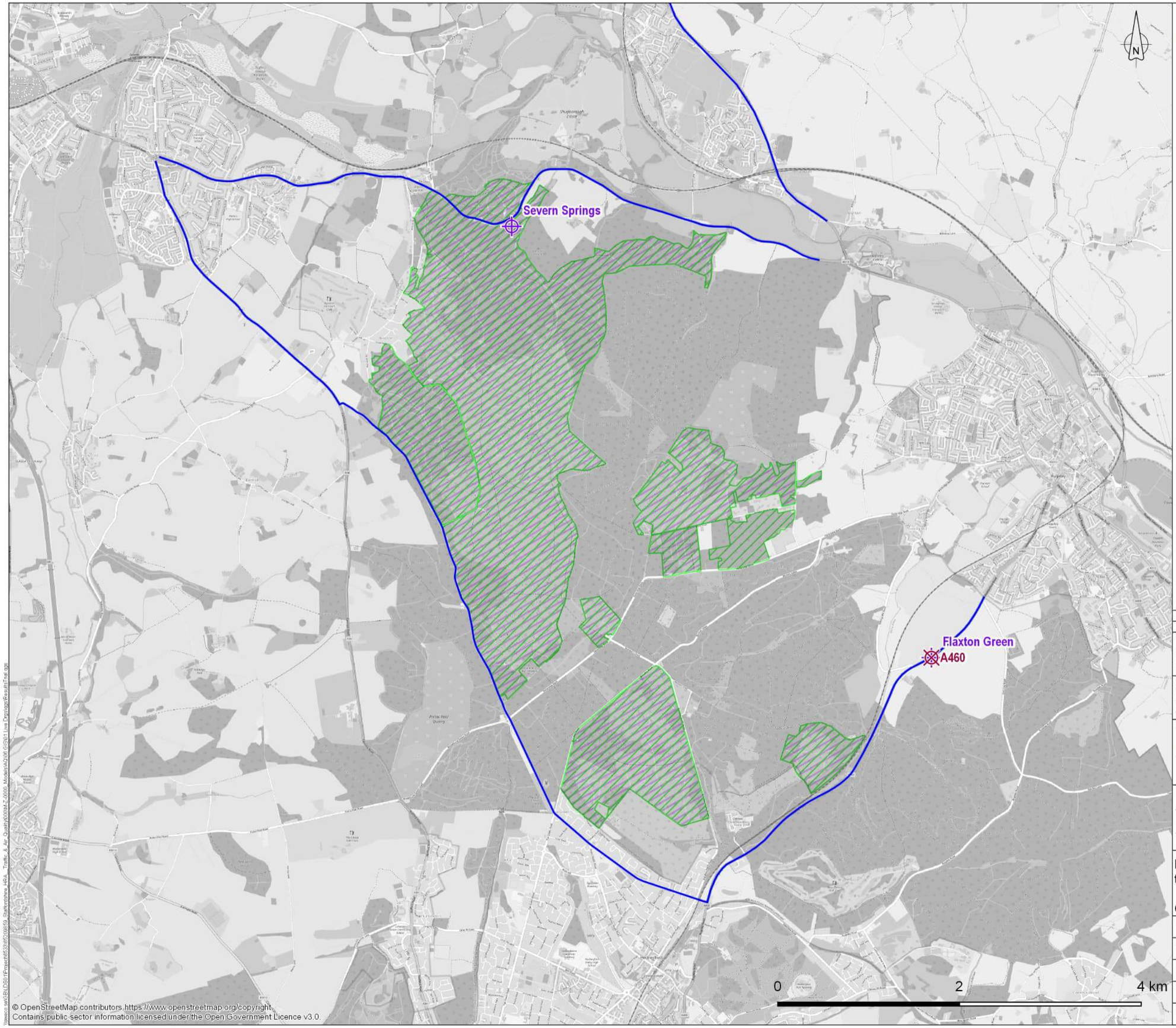
These rates of changes were uniformly applied to background NH_3 concentrations and N deposition rates in this assessment for the period 2020 (APIS background midyear) to 2030 (latest future year included in Nitrogen Futures modelling) and used as representative background data for the 2042 scenarios.

Acid deposition rates for the future year (2042) were conservatively assumed to remain the same as at 2020 background.

Further to the above, Stafford Borough Council and Cannock Chase District Council provided NO_2 and NH_3 monitoring data for a number of locations in proximity to relevant European sites, as summarised in **Table 4**, to provide additional baseline data to inform the assessment.

Data were provided for years 2020 to 2023 inclusive. Given the influence of national travel restrictions during 2020 and 2021 (Covid-19) on vehicle movements and emissions, monitoring data for those years are excluded from this report. The monitoring locations are depicted in **Figure 3**.

[17] Joint Nature Conservation Committee (2020) *Nitrogen Futures*. JNCC Report No. 665.

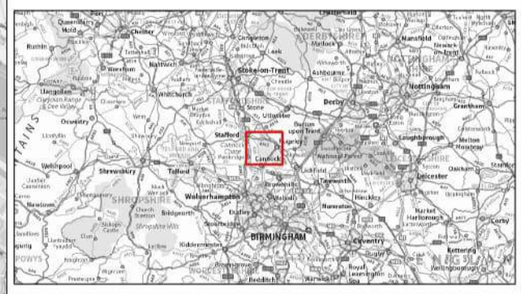


Legend

- Modelled Roads (HRA)
- NO_2 Diffusion Tube Monitoring Locations
- NH_3 Diffusion Tube Monitoring Locations

Designated Nature Conservation Sites

- Site of Special Scientific Interest (SSSI)
- Special Area of Conservation (SAC)



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Assessment of Air Quality Impacts on European Sites in Staffordshire, Wolverhampton, Walsall, Sandwell, and Dudley

Drawing Title

Figure 3.1 Air quality monitoring locations included in the assessment (NO_2 and NH_3)

Cannock Chase SAC/SSSI

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268 WS
268 WSB

N

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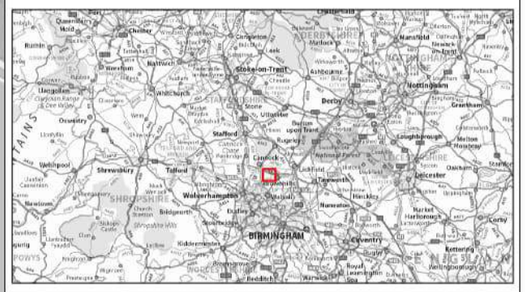
0.6
1.2 km

Legend

- Modelled Roads (HRA)
- Additional Model Verification Roads
- NO_2 Diffusion Tube Monitoring Locations

Designated Nature Conservation Sites

- Site of Special Scientific Interest (SSSI)
- Special Area of Conservation (SAC)



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Drawing Title

Figure 3.2 Air quality monitoring locations included in the assessment (NO_2 and NH_3)

Cannock Extension Canal SAC/SSSI

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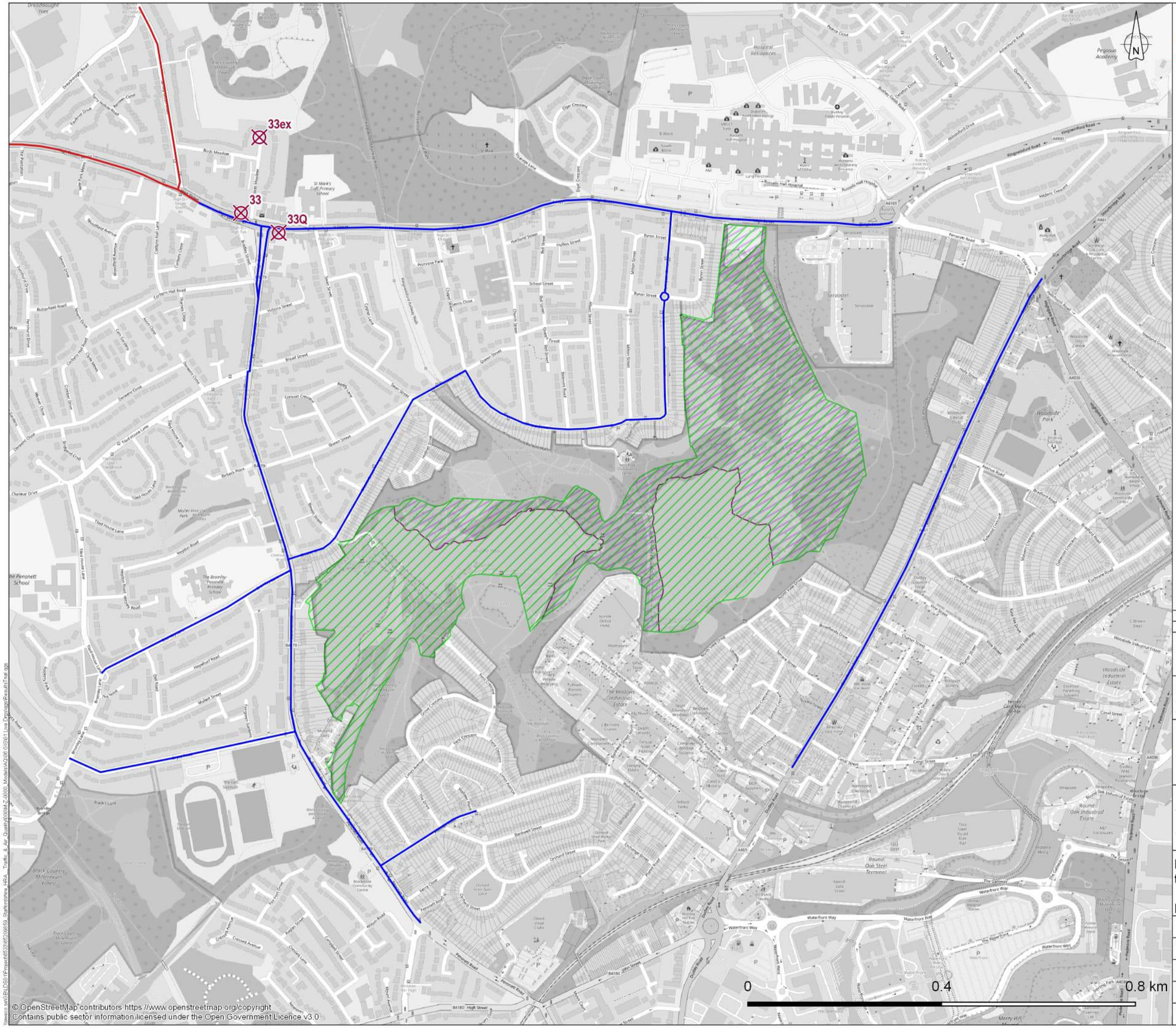
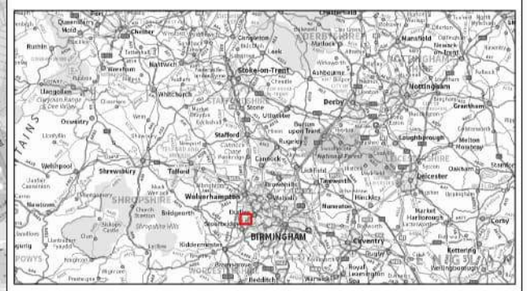


Legend

- Modelled Roads (HRA)
- Additional Model Verification Roads
- NO_2 Diffusion Tube Monitoring Locations

Designated Nature Conservation Sites

- Site of Special Scientific Interest (SSSI)
- Special Area of Conservation (SAC)



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Drawing Title

Figure 3.3 Air quality monitoring locations included in the assessment (NO_2 and NH_3)

Fens Pools SAC/SSSI

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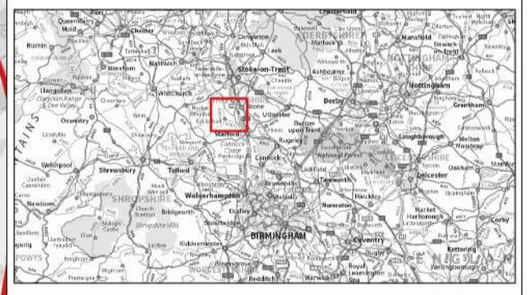
Legend

- Modelled Roads (HRA)
- Additional Model Verification Roads
- NO_2 Diffusion Tube Monitoring Locations
- NH_3 Diffusion Tube Monitoring Locations

Designated Nature Conservation Sites

- Site of Special Scientific Interest (SSSI)
- Wetland of International Importance (Ramsar)



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Drawing Title: Figure 3.4 Air quality monitoring locations included in the assessment (NO_2 and NH_3)

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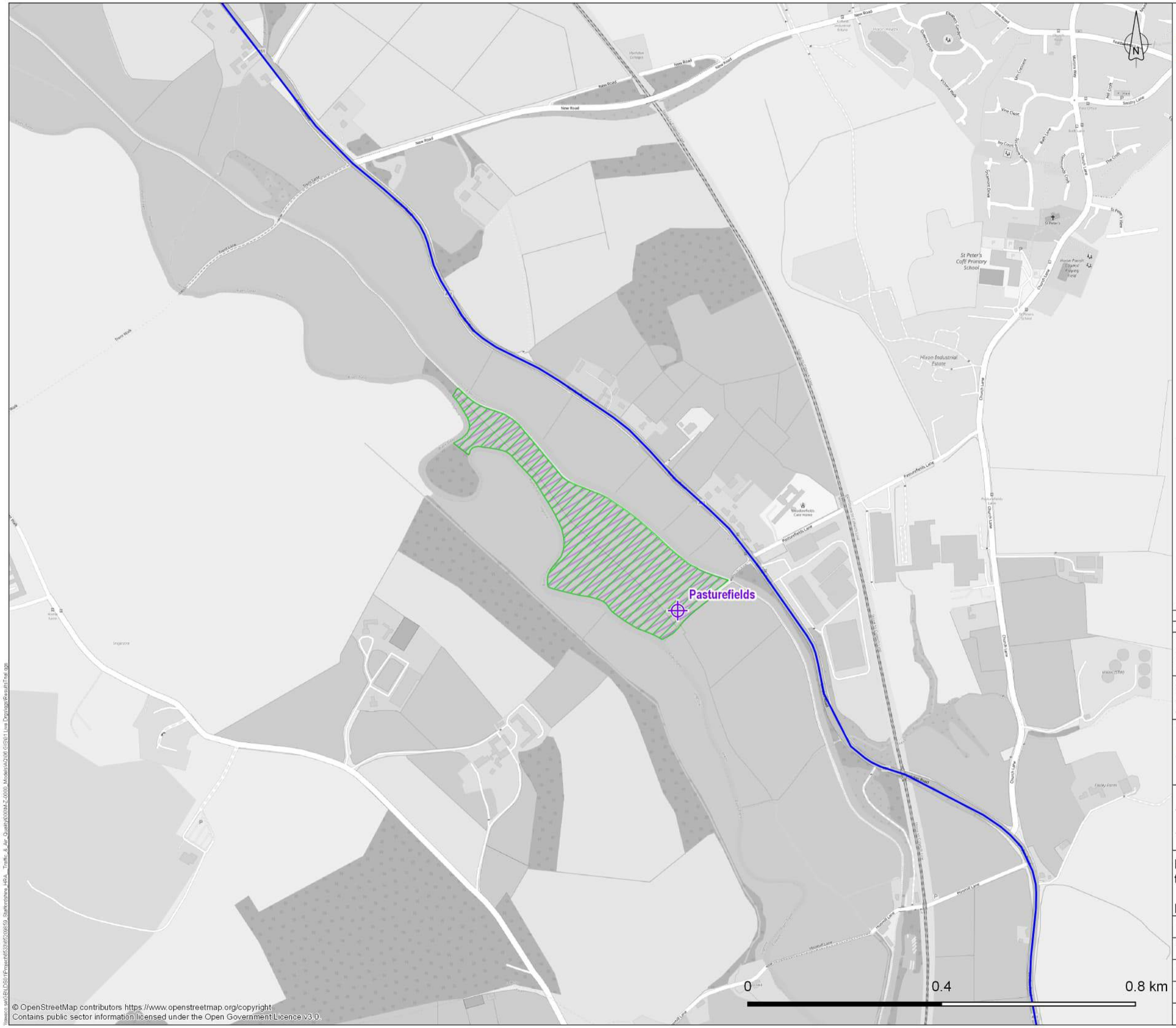
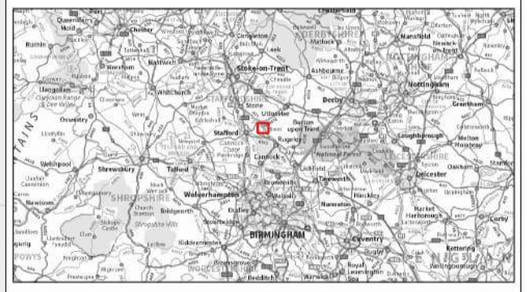


Legend

- Modelled Roads (HRA)
- NH_3 Diffusion Tube Monitoring Locations

Designated Nature Conservation Sites

- Site of Special Scientific Interest (SSSI)
- Special Area of Conservation (SAC)



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Drawing Title: Figure 3.5 Air quality monitoring locations included in the assessment (NO_2 and NH_3)

Pasturefields Salt Marsh SAC/SSSI

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Table 4: Relevant air pollutant (NO_2 and NH_3) monitoring locations in proximity to European sites

Monitoring Site ID	Location Description	Nearest European Site	OS Grid Reference	
			X	Y
CM1*	Roadside, adjacent to Copmere Lane and on fringe of woodland belt separating road and Cop Mere	Midlands Meres and Mosses Phase 2 Ramsar (Cop Mere)	380303	329457
SS1*	Rural background, within Punchbowl Car Park, approx. 80 m south of A513	Cannock Chase SAC	398391	320677
FG1**	Roadside, adjacent to A460 Hednesford Road	Cannock Chase SAC	403009	315930
PF1*	Rural, positioned in centre of field within Pasturefields SAC	Pasturefields SAC	399315	324738

Notes:
* Data provided by Stafford Borough Council
** Data provided by Cannock Chase District Council (site also referred to as 'A460, Rugeley')

Model Verification

The model verification process was conducted in accordance with the guidance outlined in LAQM.TG22. Modelled annual mean NO_2 concentrations for the 2022 base year scenario were compared to the equivalent 2022 monitored data at appropriate air quality monitoring locations within the study area. The associated monitoring site data were obtained from Partnership Authorities, namely Stafford Borough, Cannock Chase District, and Dudley Metropolitan Borough councils.

This enabled the derivation of appropriate model adjustment factors, specific to modelled road-NO_x concentrations, to ensure the performance of the dispersion model was acceptable within the context of relevant statistical parameters. The adjustment factors were subsequently applied to all modelled road-NO_x outputs in the 2022 Baseline and 2042 future year scenarios.

Given the geographical extent of the study area, zonal model verification was undertaken based on the local authority area. Further details of the modelling process, input data and the model verification and adjustment procedure are presented in **Appendix B**.

Processing of Model Outputs

Annual Mean NO_x Concentrations

Verified and adjusted annual mean road-NO_x concentrations were modelled at each receptor within the respective European site. The corresponding annual mean background NO_x concentrations were added, dependent on the year and grid square location, to derive the total annual mean NO_x concentrations at each receptor.

Annual Mean NH_3 Concentrations

At present, Defra has not published vehicle emissions factors for NH_3 as part of EFT v12 or other LAQM tools, given that NH_3 is not a relevant pollutant under the LAQM framework.

However, National Highways have published a calculator tool (v4, published January 2024) that applies a ratio between NO_x and NH_3 vehicle emissions (light and heavy vehicles), such that the

modelled road-NO_x concentration can be converted to a road-NH_3 concentration[18]. The ratio applied at each receptor is dependent of the assessment year, vehicle type (light or heavy) and the dominant road type (i.e. motorway, urban, rural).

The resulting road-NH_3 concentrations from light and heavy vehicles were summed and added to the corresponding annual mean background values to derive total annual mean NH_3 concentrations at each receptor.

Nitrogen Deposition from NO_2 and NH_3

Rates of N deposition specific to the contribution from vehicle emissions were derived from both road-NO_2 and road-NH_3 concentrations in each scenario. The modelled road-NO_x concentrations were converted to road-NO_2 using the Defra NO_x-NO_2 calculator v8.1[19]. The associated N deposition rate from the road-NO_2 concentration was derived by applying the following conversions[20], based on habitat type:

- Grassland and similar habitats; 1 µg/m^3 NO_2 = 0.14 kgN/ha/yr
- Forests and similar habitats; 1 µg/m^3 NO_2 = 0.29 kgN/ha/yr

The associated N deposition rate from the road-NH_3 concentration was derived by applying the following conversions[20], based on habitat type:

- Grassland and similar habitats; 1 µg/m^3 NH_3 = 5.19 kgN/ha/yr
- Forests and similar habitats; 1 µg/m^3 NH_3 = 7.79 kgN/ha/yr

The modelled N deposition rates associated with both road-NH_3 and road-NO_2 were summed and added to the relevant background to derive a total deposition rate at each receptor.

Acid Deposition from NO_2 and NH_3

The rates of acid deposition specific to the contributions from both road-NO_2 and road-NH_3 concentrations were derived by applying the following conversions by habitat type, based on 1 keqN/ha/yr being equal to 14 kgN/ha/yr:

- Grassland and similar habitats;
  - 1 µg/m^3 NO_2 = 0.01 keqN/ha/yr
  - 1 µg/m^3 NH_3 = 0.37 keqN/ha/yr
- Forests and similar habitats;
  - 1 µg/m^3 NO_2 = 0.02 keqN/ha/yr
  - 1 µg/m^3 NH_3 = 0.56 keqN/ha/yr

The modelled acid deposition rates associated with both road-NH_3 and road-NO_2 were summed and added to the relevant background to derive a total acid deposition rate at each receptor.

[18] Another NH_3 vehicle emissions tool has been published by Air Quality Consultants (Calculator for Road Emissions of Ammonia (CREAM V1A), 2020). However, the data on which the National Highways tool (2024) is based supersedes the data used in CREAM. Furthermore, the National Highways tool has been independently peer reviewed and supported by IAQM. As such, this tool was selected for use in this assessment.

[19] Defra (2020*) NO_x to NO_2 calculator v8.1* (available via: https://laqm.defra.gov.uk/air-quality/air-quality-assessment/nox-to-no2-calculator/; accessed May 2024)

[20] Derived based on recommended dry deposition velocities as per Environment Agency's Air Quality Technical Advisory Group (AQTAG) document – AQTAG06 (March 2014) *Technical guidance on detailed modelling approach for an appropriate assessment for emissions to air*

3.3.3 Significance Screening Criteria

The results of the atmospheric dispersion modelling at each receptor have been compared to the assessment benchmarks, as specified in **Table 1** for NO_x and NH_3 annual mean critical levels and as stated in **Section 4** for N and acid deposition rate critical loads, where applicable, to evaluate the potential for exceedances in all scenarios.

The magnitude of change in predicted NO_x and NH_3 concentrations and N and acid deposition rates at each receptor, as a result of the Partnership Authorities emerging Local Plans implementation (i.e. the in-combination impact), has been derived through comparing the ***2042 Alternative Future Baseline*** and ***2042 With Partnership Local Plans*** scenarios.

The in-combination impact is expressed as a percentage of the respective critical level (NO_x and NH_3) and the lowest value of the relevant critical load ranges for N-deposition and acid deposition (see **Table 7, Section 4.2**). With reference to Natural England guidance[12], where the change in concentration/deposition rate exceeds 1% of the relevant critical level / load, the potential for significant effects on the sensitive feature(s) to occur cannot be screened out. Below the 1% significance screening threshold, the impacts can be treated as imperceptible, resulting in no significant effect.

If the assessment results predict that the 1% significance screening criterion is exceeded at any sensitive habitat, the results of the air quality assessment are passed to the appointed suitably qualified ecologist to undertake an Appropriate Assessment to determine the likely impacts on the integrity of the relevant European site.

3.4 Assumptions & Limitations

The approach to the air quality assessment aligns with the scope detailed in the Middlemarch brief[1] and, in line with the brief, has excluded the European sites scoped out of the assessment. Both the scope of assessment and reasoning for excluding relevant European sites was agreed in writing by Natural England[2].

There are uncertainties associated with both measured and predicted concentrations of airborne pollutants. The model (ADMS-Roads) used in this assessment relies on input data, including predicted traffic flows, which are subject to uncertainty. The model itself simplifies complex physical systems into a range of algorithms. In addition, local micro-climatic conditions may affect the concentrations of pollutants that the ADMS-Roads model will not consider.

To reduce the uncertainty associated with modelled concentrations, model verification has been carried out with reference to guidance set out in LAQM.TG22. As the model has been verified against local authority monitoring data (NO_2) and adjusted accordingly, there can be reasonable confidence in the predicted concentrations. The root mean square error (i.e. average model uncertainty) of the verified model ranges from 2.5 µg/m^3 to 3.6 µg/m^3, within the ideal range (4 µg/m^3) given by LAQM.TG22. Furthermore, the fractional bias of the verified model, a measure of model tendency to under- or over-predict, is close to zero, indicating there is no systematic tendency either way. Further details of the model verification procedure are provided in **Appendix B**.

Vehicle emissions of NO_x have been derived using Defra's EFT v12.0, the latest version at the time of completing this assessment. Vehicle emissions factors are provided by the EFT up to year 2050. However, the associated LAQM tools (i.e. background pollutant maps and NO_x to NO_2 calculator) currently support assessment years up to 2030 only. It can be reasonably expected that vehicle exhaust emissions of NO_x will decline further beyond 2030, given the UK Government's commitment to cease the sale of new petrol and diesel cars in 2035. Therefore, the use of 2030 emissions factors for the future year (2042) model scenarios represents a conservative approach.

The adopted critical levels and lower critical loads applied in this assessment are based on the information provided by Middlemarch Environmental Ltd[1], which were provided for the relevant qualifying habitat(s) or habitats on which qualifying species rely at each respective European site or associated land parcel (see **Table 7, Section 4.2**).

The adopted and emerging Local Plan site allocations data provided by the Partnership Authorities, which were utilised for the transport modelling study[3], did not indicate the potential for emissions from other non-road plans and projects (i.e. point source emissions from the industrial, energy, and/or waste management sectors, for example). Therefore, the background data obtained from Defra and APIS, which were used in this assessment, were assumed to capture any significant contributions from non-road emissions.

4 Baseline Conditions

4.1 Baseline Air Pollutant Monitoring

The 2022 and 2023 annual mean NO_2 and NH_3 concentrations relating to the Stafford Borough and Cannock Chase District monitoring sites, as per **Table 4**, are presented in **Table 5**.

Table 5: Monitored annual mean NO_2 and NH_3 concentrations for 2022 and 2023 (Units: µg/m^3)

Monitoring Site ID	Nearest European Site	Annual Mean NO_2		Annual Mean NH_3	
		2022	2023	2022	2023
CM1*	Midlands Meres and Mosses Phase 2 Ramsar (Cop Mere)	6.4	6.8	5.8	5.7
SS1*	Cannock Chase SAC	7.2	5.9	3.9	3.3
FG1**	Cannock Chase SAC	16.8	16.2	4.3	4.7
PF1*	Pasturefields Salt Marsh SAC	8.3	8.3	5.5	7.7
	Critical Level (µg/m^3)	**n/a**		**1 or 3**	

The results of the monitoring confirm that levels of NO_2 are sufficiently low that, based on the NO_x to NO_2 relationship, there is confidence that the equivalent annual mean NO_x concentration will be below the critical level (30 µg/m^3) at all locations. However, it is evident that the monitored annual mean concentrations of NH_3 have remained above the respective critical levels of 1 µg/m^3 (Cop Mere and Cannock Chase) and 3 µg/m^3 (Pasturefields Salt Marsh) in both years.

The monitored NH_3 concentrations are demonstrably higher than the APIS background equivalents in **Table 6** below. However, given the seasonal variability in NH_3 emissions driven by agricultural activities and the spatial resolution of the APIS data (1 km^2) relative to a single monitoring point, variability between the data is to be expected.

With the exception of site PF1, annual mean NH_3 concentrations do not vary significantly between 2022 and 2023. At PF1, the change in NH_3 concentrations (+2.2 µg/m^3) is likely to be related to adjacent agricultural activities, given its location within a field and largely unaffected by road emissions.

4.2 Background Data and Environmental Benchmarks

The published Defra and APIS background data relating to annual mean NO_x and NH_3 concentrations, in addition to annual N deposition and acid deposition rates for the relevant European sites, are summarised in **Table 6**. The ranges in background values are presented from across the extent of the modelled study area.

The associated critical levels and critical load ranges that represent the environmental benchmarks adopted for each European site, according to the qualifying habitat(s), are presented in **Table 7**.

The background (2022) and future year (2042) NO_x concentrations are demonstrably below the annual mean critical level (30 µg/m^3) at all European sites. The annual mean NH_3 background concentrations exceed the relevant critical levels at Cannock Chase SAC, Oakhanger Moss, and Cop Mere, with the remaining sites being below. Whilst the NH_3 background at Pasturefields Salt Marsh SAC is below the critical level (3 µg/m^3), the monitored concentrations in 2022 and 2023 reported in **Table 5** indicate the potential for it to be currently exceeded.

Background N deposition rates in both the baseline and future years are projected to exceed the respective lower critical loads at each European site / land parcel, with the exception of Pasturefields Salt Marsh SAC, for which baseline N deposition is marginally below the lower critical load. However, as indicated by the relatively elevated NH_3 ambient concentrations monitored at this site, there is also the potential for the lower critical load to be currently exceeded.

There are only two of the European sites / land parcels that are known to be sensitive to acidification, namely Cannock Chase SAC and Oakhanger Moss. The background acid deposition rates attributed to nitrogen at both sites, as reported in **Table 6**, are above the respective critical loads in **Table 7**.

Table 6: Site specific background annual mean NO_x / NH_3 concentrations and annual N / acid deposition rates (Source: Defra & APIS)

European Site / Land Parcel	NO_x Annual Mean Background (µg/m^3)**		NH_3 Annual Mean Background (µg/m^3)^		N Deposition Background (kgN/ha/yr)^		Acid (N) Deposition Background (keq/ha/yr)^^	
	2022	2042	2022	2042	2022	2042	2022	2042
Cannock Chase SAC	8.7 – 10.6	6.6 – 8.7	1.7 – 2.2	1.7 – 2.2	17.6 – 32.5	15.7 – 29.1	1.3 – 2.4	1.3 – 2.4
Cannock Extension Canal SAC	14.3 – 14.7	11.4 – 11.8	1.8	1.8 – 1.9	17.2 – 17.3	15.4 – 15.5	N/A	
Fens Pools SAC	17.2 – 19.4	14.2 – 16.3	1.8 – 1.9	1.9	16.6 – 17.0	14.9 – 15.2	N/A	
Pasturefields Salt Marsh SAC	9.4 – 9.7	8.1 – 8.4	2.4	2.4	19.3 – 19.5	17.3 – 17.5	N/A	
Oakhanger Moss*	10.8 – 11.5	8.5 – 9.2	3.4 – 3.5	3.4 – 3.5	25.8 – 25.9	23.1 – 23.2	2.0	2.0
Cop Mere*	6.1 – 6.3	5.1 – 5.3	3.2	3.2 – 3.3	23.7 – 41.7	21.2 – 37.4	N/A	

Notes:

* Land parcels within Midlands Meres & Mosses Phase 2 Ramsar Site.

** Obtained from Defra background maps. Latest projected year is 2030 (used as proxy for 2042 backgrounds in this assessment).

^ APIS three year average (2019-2021) adopted for 2022 Baseline. Backgrounds for future year (2042) scenarios were adjusted with reference to JNCC's Nitrogen Futures report (2020) based on the 'business as usual' scenario[17].

^^ APIS three year average (2019-2021) adopted for 2022 Baseline and conservatively assumed as unchanged in 2042. 'N/A' indicates that the European site / land parcel has not been assessed for acid deposition because the habitat(s) is not sensitive to acidification or no critical load data are available.

Table 7: Site specific critical levels (NH_3) and critical loads adopted as environmental benchmarks

European Site / Land Parcel	Qualifying Habitats	NH_3 Annual Mean Critical Level ($\mu g/m^3$)	N Deposition Critical Load Range** (kgN/ha/yr)	Acid (N) Deposition Critical Load (keq/ha/yr)	Relevant RAP Location(s)	Vegetation Type^
Cannock Chase SAC	European dry heaths	1	10 - 20	1.285	1, 3	Grassland
	Northern Atlantic wet heaths with *Erica tetralix*				2	Woodland
Cannock Extension Canal SAC	Permanent oligotrophic waters: Softwater lakes	3	10	N/A	10, 11	Grassland
Fens Pools SAC	Permanent oligotrophic waters: Softwater lakes	3	10	N/A	12, 13	Woodland^^
Pasturefields SAC	Inland salt meadows	3	20 – 30***	N/A	4	Grassland
Oakhanger Moss*	Broadleaved deciduous woodland	1	10 – 20	1.946	25	Grassland
	Rich fens	3	15 – 30	N/A		
	Valley mires, poor fens and transition mires	1	10 – 15	0.9		
	Raised and blanket bogs	1	5 – 10	0.573		
	Moist and wet oligotrophic grasslands: Molinia caerulea meadows	1	15 – 25	1.338		
Cop Mere*	Permanent dystrophic lakes, ponds and pools	1	10	N/A	8	Grassland

Notes:

* Land parcels within Midlands Meres & Mosses Phase 2 Ramsar Site.

** Lower critical load value adopted as benchmark. Where multiple qualifying habitats exist with varying critical load ranges, the lowest critical load is adopted.

*** No critical load range is available for inland salt meadows, as such the values for coastal saltmarsh are recommended to be used instead.

^ Used to define appropriate deposition velocity for NO_2 and NH_3.

^^ Representative of substantial areas of mature woodland between key roads and qualifying habitat.

5 Dispersion Modelling Assessment Results

This section presents:

- The results of the in-combination traffic screening, with reference to the criteria stipulated in Natural England guidance[12] and as described in **Section 3.2**, to determine which European sites / land parcels were screened in/out of the modelling assessment.
- For the sites screened into the assessment, a summary of the dispersion model results at receptors with an in-combination impact equal to or above the 1% significance screening criterion, relative to the assessment benchmarks for NO_x, NH_3, N deposition and/or acid deposition.

The locations and spatial extents of any modelled exceedances of the respective 1% screening criterion are depicted in **Figure 5** (annual mean NH_3), **Figure 6** (N deposition), and **Figure 7** (acid deposition).

The assessment results tables presented in **Appendix C** report the maximum modelled concentration / deposition rate value at each 10 m interval within the respective European site, taken from the boundary closest to the modelled road network to 200 m within the boundary.

Data pertaining to each receptor output point for each pollutant and each scenario (i.e. complete data set of model results) can be provided on request. Full data tables have been excluded from this report to limit file size.

5.1 Traffic Screening Outputs

The outputs of the screening exercise at each RAP location, which focussed on the in-combination traffic flow impact between the ***2042 Alternative Future Baseline*** and the ***2042 With Partnership Authorities Local Plans***, are presented in **Table 8**. The road links associated with each RAP location and corresponding in-combination traffic flow impacts are visualised in **Figure 4**.

The outcomes confirm that each European site / land parcel was screened into the dispersion modelling assessment based on the in-combination traffic flow impact, with the exception of Cop Mere where the in-combination change in traffic is (+52 AADT) is well below the 1,000 domestic AADT criterion.

In addition, following consultation with Natural England in September 2024[21], it was agreed that Oakhanger Moss could be justifiably screened out of the air quality assessment, as the in-combination traffic changes is almost entirely attributed to national background growth at RAP 25 (M6 motorway). The contribution to the traffic change attributed to the Partnership Authorities Local Plans is forecast to be below 100 domestic AADT, which is notably below the 1,000 AADT screening threshold.

The subsections below present the results of the air quality modelling for the 2042 future year scenarios at the sites screened into the assessment.

[21] Partnership Authorities Steering Group Meeting, dated 25 September 2024, attended by Natural England's Principal Officer – Flexible Casework Team. Natural England agreed that Oakhanger Moss could be screened out of the HRA air quality assessment on the basis that the increase in traffic at RAP 25 (M6 motorway) between the 2042 Alternative Future Base and 2042 With Partnership Authorities Local Plans was predominantly attributed to national background traffic growth (>7,000 domestic AADT). By comparison, the in-combination contribution from of the Partnership Authorities Local Plans is forecast to be less than 100 (one hundred) domestic AADT at RAP 25 (M6) and will not result in an impact above the 1% significance screening criterion for any of the assessed pollutants at Oakhanger Moss.

Table 8: Outputs of the in-combination traffic screening exercise (2042 Alternative Future Baseline versus 2042 With Partnership Authorities Local Plans)

European Site / Land Parcel	RAP Ref	Transport Model Road Link Ref*	2042 Alternative Future Base		2042 With Partnership Authorities Local Plans		In-combination impact**		Screened in?
			AADT	HDV	AADT	HDV	AADT	HDV	
Cannock Chase SAC	1	101887_102675	10,529	223	11,825	234	**1,296**	11	**Yes**
	2	110399_514326	12,161	469	14,117	488	**1,956**	19	**Yes**
		514990_514993	13,047	469	15,269	488	**2,222**	19	**Yes**
		512070_512072	11,746	352	13,801	366	**2,055**	14	**Yes**
	3	110411_5100228	3,224	69	3,619	74	395	3	No^
Cannock Extension Canal SAC	10	107909_108012	28,912	4,207	32,790	4,333	**3,878**	123	**Yes**
		102666_108012	28,834	4,015	32,783	4,176	**3,949**	161	**Yes**
		102666_114315	27,863	4,207	31,642	4,392	**3,779**	185	**Yes**
	11	108013_102666	6,338	85	7,409	88	**1,071**	3	**Yes**
		102704_108013	10,841	184	12,381	191	**1,540**	7	**Yes**
Fens Pools SAC	12	101619_113158	24,372	1,030	26,823	1,071	**2,451**	41	**Yes**
		101619_513086	18,304	779	20,125	810	**1,821**	31	**Yes**
		101505_514544	21,244	476	23,232	495	**1,988**	19	**Yes**
	13	110340_513027	18,581	285	20,629	296	**2,048**	11	**Yes**
		101710_513028	19,525	441	21,556	458	**2,031**	17	**Yes**
Pasturefields SAC	4	102212_102675	9,128	739	10,222	769	**1,094**	30	**Yes**
Oakhanger Moss***	25	100775_100940	64,578	13,691	68,062	14,238	**3,484**	**547**	**Yes**
		100940_100775	64,169	12,705	67,860	13,485	**3,691**	**780**	**Yes**

European Site / Land Parcel	RAP Ref	Transport Model Road Link Ref*	2042 Alternative Future Base		2042 With Partnership Authorities Local Plans		In-combination impact**		Screened in?
			AADT	HDV	AADT	HDV	AADT	HDV	
Cop Mere	8	5100230_5100231	652	31	704	32	52	1	No

Notes:

* Traffic data at some RAPs were provided as directional flows (e.g. westbound and eastbound) and/or the RAP link was associated with a number of discrete road sections.

** Bold indicates exceedance of 1,000 domestic AADT flows or 200 HDV flows criteria.

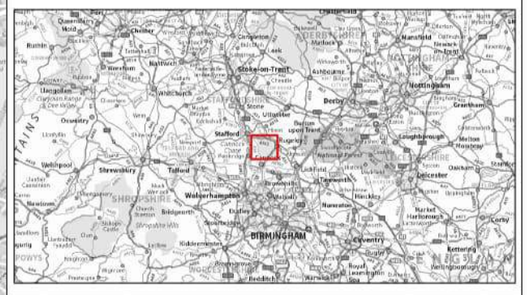
*** Screened out of the air quality assessment following consultation with Natural England[21].

^ Although this road link did not exceed the criteria, it was included in the air quality model for completeness due to other RAPs associated with Cannock Chase SAC exceeding.

Legend

Designated Nature Conservation Sites

- Site of Special Scientific Interest (SSSI)
- Special Area of Conservation (SAC)



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Assessment of Air Quality Impacts on European Sites in Staffordshire, Wolverhampton, Walsall, Sandwell, and Dudley

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Figure 4.1 Predicted in-combination traffic flow impact at each relevant RAP road link(s)

Cannock Chase SAC/SSSI

Project Stage			
n/a			
Status: n/a	Status Description: n/a		
Drawn: LFS	Designed: LFS	Checked: DP	Approved: DP
Sheet Size: A3	Scale: 1:27,500	Sweco Ref: 65209859	Revision: P01.1

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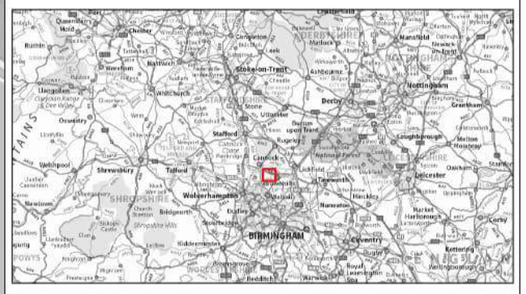

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Figure 4.2 Predicted in-combination traffic flow impact at each relevant RAP road link(s)

Cannock Extension Canal SAC/SSSI

Project Stage			
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Sheet Size: A3	Scale: 1:10,000	Sweco Ref: 65209859	Revision: P01.1

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Legend

Designated Nature Conservation Sites

- Site of Special Scientific Interest (SSSI)
- Special Area of Conservation (SAC)

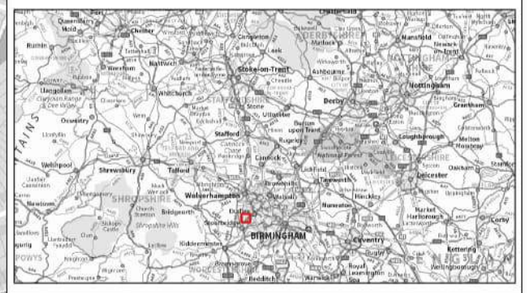

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Figure 4.3 Predicted in-combination traffic flow impact at each relevant RAP road link(s)

Fens Pools SAC/SSSI

Project Stage			
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Sheet Size: A3	Scale: 1:5,000	Sweco Ref: 65209859	Revision: P01.1

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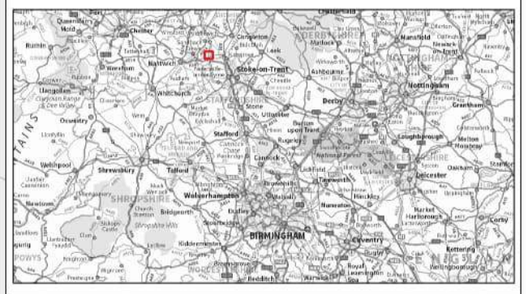
Designated Nature Conservation Sites

- Site of Special Scientific Interest (SSSI)
- Wetland of International Importance (Ramsar)



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Drawing Title: Figure 4.4 Predicted in-combination traffic flow impact at each relevant RAP road link(s)

Oakhanger Moss SSSI (Ramsar)

Project Stage			
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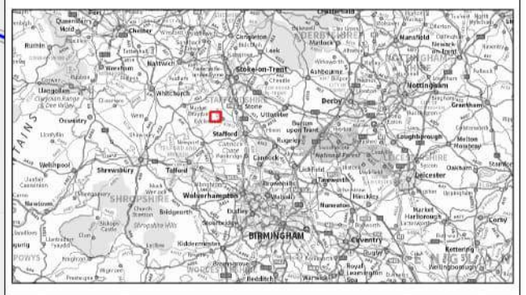
Legend

Designated Nature Conservation Sites

- Site of Special Scientific Interest (SSSI)
- Wetland of International Importance (Ramsar)



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Drawing Title

Figure 4.5 Predicted in-combination traffic flow impact at each relevant RAP road link(s)

Cop Mere SSSI (Ramsar)

Project Stage			
n/a			
Status	Status Description		
n/a	n/a		
Drawn	Designed	Checked	Approved
LFS	LFS	DP	DP
Sheet Size	Scale	Sweco Ref	Revision
A3	1:7,000	65209859	P01.1

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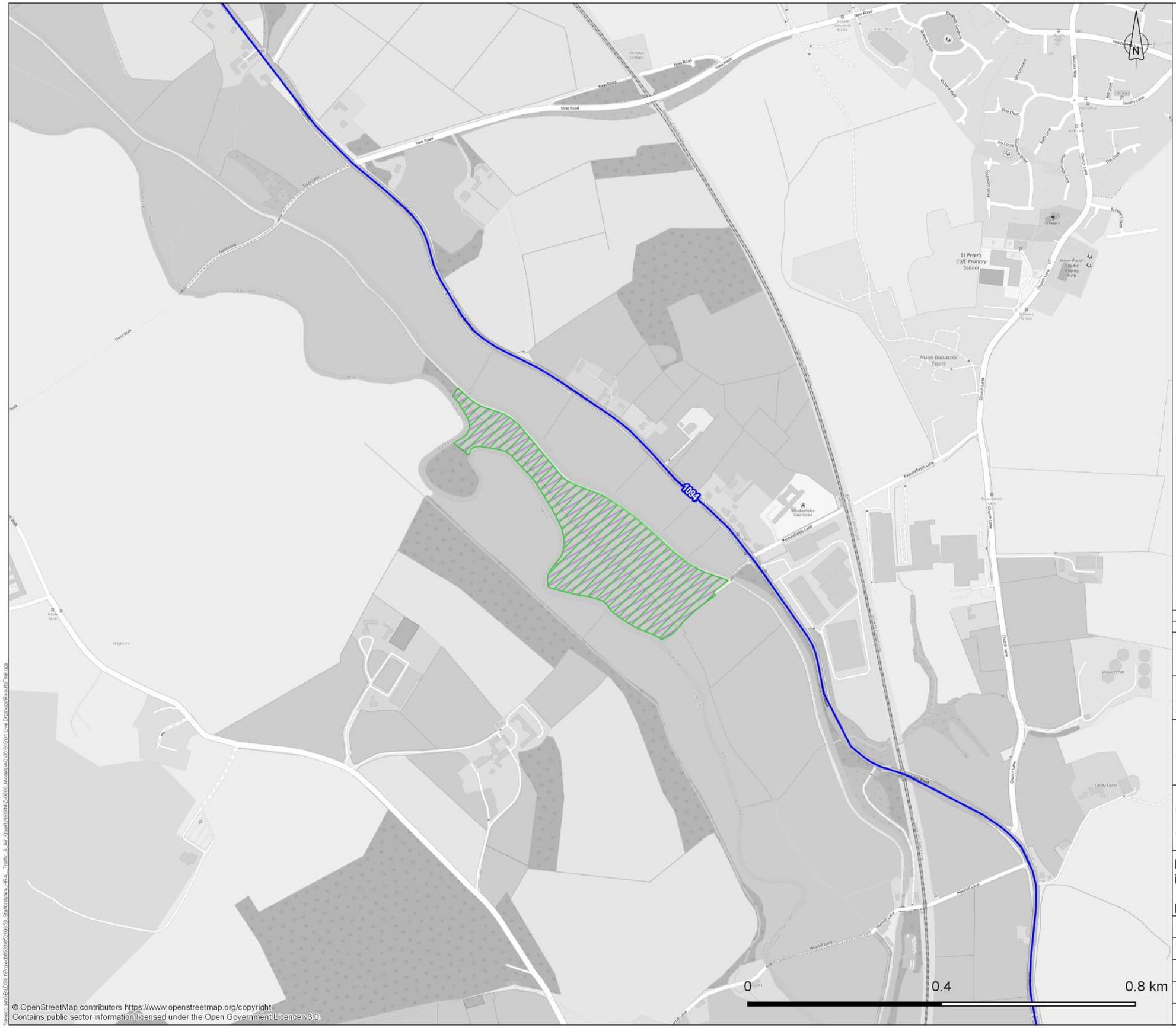
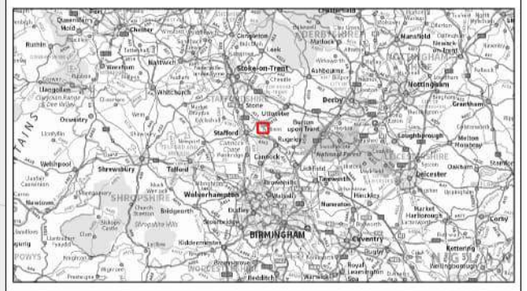


Legend

Designated Nature Conservation Sites

- Site of Special Scientific Interest (SSSI)
- Special Area of Conservation (SAC)



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Assessment of Air Quality Impacts on European Sites in Staffordshire, Wolverhampton, Walsall, Sandwell, and Dudley

Drawing Title

Figure 4.6 Predicted in-combination traffic flow impact at each relevant RAP road link(s)

Pasturefields Salt Marsh SAC/SSSI

Project Stage			
n/a			
Status: n/a	Status Description: n/a		
Drawn: LFS	Designed: LFS	Checked: DP	Approved: DP
Sheet Size: A3	Scale: 1:7,500	Sweco Ref: 65209859	Revision: P01.1
Drawing Number: 65209859-SWE-XX-XX-D-AQ-0004			

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5.2 Annual Mean NO_x

A summary of the predicted changes in annual mean NO_x concentrations at all modelled receptor points within each relevant European site is presented in **Table 9**. The maximum modelled in-combination impacts at each distance interval are presented in **Appendix C** (Table C1).

The results reported in **Table 9** demonstrate that there are no modelled exceedances of the critical level (30 µg/m^3) within any of the European sites, both in the 2042 Future Baseline and 2042 With Partnership Local Plans scenarios.

On a site-specific basis, the following applies:

- **Cannock Chase SAC** – From a total of 9,788 modelled receptors, 123 were modelled to exceed the 1% significance screening criterion for in-combination impacts, exclusively located directly adjacent to the A513 (RAP 1) that passes through the northern area of the SAC. However, the maximum predicted annual mean NO_x concentration in the With Plans scenario (12.6 µg/m^3) is demonstrably below the critical level.
- **Cannock Extension Canal SAC** – A higher proportion of in-combination impacts (72 of 179 receptors) exceeded the 1% criterion, focussed adjacent to the south of A5 Watling Street (RAP 10) and north of Lime Lane (RAP 11). The maximum modelled annual mean concentration in the With Plans scenario (21.8 µg/m^3) remains well below the critical level.
- **Fens Pools SAC** – A total of 61 of the 3,851 modelled receptors were predicted to exceed the 1% criterion, all of which are focussed within 50 m of the A4101 High Street (RAP 12) within the north of the SAC. The maximum annual mean concentration (26.3 µg/m^3) modelled in the With Plans scenario is approximately 12% (3.7 µg/m^3) below the critical level.
- **Pasturefields Salt Marsh SAC** – The maximum modelled annual mean concentration (8.8 µg/m^3) was predicted to be well below the critical level in both the Future Baseline and With Plans scenarios. There were no modelled in-combination impacts above the 1% criterion.

Based on the above, the Partnership Authorities emerging Local Plans are expected to have no likely significant effect on the European sites with respect to ambient NO_x concentrations.

Table 9: Summary of modelled annual mean NO_x concentrations and in-combination impacts *(2042 Alternative Future Baseline vs 2042 With Partnership Local Plans*)

Parameter	Cannock Chase SAC		Cannock Extension Canal SAC		Fens Pools SAC		Pasturefields Salt Marsh SAC	
	Future Base	With Plans	Future Base	With Plans	Future Base	With Plans	Future Base	With Plans
Max. Road Contribution (*Model*) (µg/m^3)	4.8	5.3	9.2	10.4	10.7	11.9	0.3	0.4
Max. Total Concentration (*Model* + *Background*) (µg/m^3)	12.1	12.6	20.6	21.8	25.1	26.3	8.8	8.8
Number of receptors exceeding Critical Level (30 µg/m^3)	0	0	0	0	0	0	0	0
Total number of model receptors	9,788	9,788	179	179	3,851	3,851	418	418
In-Combination Impact (*2042 With Plans – 2042 Future Base*):								
Maximum worsening (µg/m^3)	0.5		1.2		1.2		0.0	
No. receptors worsening >1% criterion	123		72		61		0	

5.3 Annual Mean NH_3

A summary of the predicted changes in annual mean NH_3 concentrations at all modelled receptor points within each relevant European site is presented in **Table 10**. The maximum modelled in-combination impacts at each distance interval are presented in **Appendix C** (Table C2) and the corresponding contour plots showing the area of exceedance above the 1% significance screening criterion for each European site are depicted in **Figures 5.1 to 5.3**.

The results reported in **Table 10** demonstrate that a number of the European sites are expected to exceed the relevant critical level in both the 2042 Alternative Future Baseline and 2042 With Partnership Local Plans, owing to existing high background levels (see **Section 4**). Similarly, as visualised in the aforementioned figures, an extensive area within Cannock Extension Canal SAC is predicted to experience an in-combination impact above the 1% criterion.

On a site-specific basis, the following applies:

- **Cannock Chase SAC** – From a total of 9,788 modelled receptors, 731 were modelled to exceed the 1% significance screening criterion for in-combination impacts. These are predominantly focussed within 50 m either side of the A513 (RAP 1). A narrow band of in-combination impacts above the 1% criterion was modelled up to 30 m within the SAC adjacent to A460 Rugeley Road (RAP 2), with an even finer band of exceedance of less than 5 m adjacent to Camp Road (RAP 3). The entire site is reported to exceed the critical level (1 µg/m^3) in both the Future Baseline and With Plans scenarios.
- **Cannock Extension Canal SAC** – Approximately 40% of the SAC area was modelled to experience in-combination impacts above the 1% significance screening criterion, mainly encompassing the area of the SAC between the south of A5 Watling Street (RAP 10) and north of Lime Lane (RAP 11). The maximum modelled annual mean concentration in the With Plans scenario (3.0 µg/m^3), modelled directly adjacent to A5 Watling Street, is equal to the critical level (3 µg/m^3). This represents a maximum increase of 0.1 µg/m^3 from the Future Baseline scenario (2.9 µg/m^3).
- **Fens Pools SAC** – A total of 83 of the 3,851 modelled receptors reported an in-combination impact above the 1% criterion, which are focussed within 50 m to the south of the A4101 High Street (RAP 12). The maximum annual mean concentration (3.3 µg/m^3) modelled in the With Plans scenario represents a marginal exceedance of the critical level (3 µg/m^3), with six receptors predicted to exceed the critical level in total, all of which are located adjacent to the A4101 High Street. This represents an increase of five critical level exceedances relative to the Future Baseline scenario (one exceedance). Despite the isolated exceedances of the critical level, the vast majority of the SAC area was modelled to remain below the critical level in both scenarios.
- **Pasturefields Salt Marsh SAC** – The maximum modelled annual mean concentration (2.5 µg/m^3) was predicted to be well below the critical level in both the Future Baseline and With Plans scenarios. There were no modelled in-combination impacts above the 1% criterion. As such, a corresponding contour plot was not generated.

Based on the above, with the exception of Pasturefields Salt Marsh SAC, further Appropriate Assessment of the Partnership Authorities emerging Local Plans in-combination impacts is required by the appointed qualified ecologist.

Table 10: Summary of modelled annual mean NH_3 concentrations and in-combination impacts *(2042 Alternative Future Baseline vs 2042 With Partnership Local Plans*)

Parameter	Cannock Chase SAC		Cannock Extension Canal SAC		Fens Pools SAC		Pasturefields Salt Marsh SAC	
	Future Base	With Plans	Future Base	With Plans	Future Base	With Plans	Future Base	With Plans
Max. Road Contribution (*Model*) (µg/m^3)	0.6	0.6	1.0	1.2	1.2	1.4	0.0	0.0
Max. Total Concentration (*Model* + *Background*) (µg/m^3)	2.7	2.8	2.9	3.0	3.1	3.3	2.5	2.5
Critical Level (µg/m^3)	**1**		**3**		**3**		**3**	
Number of receptors exceeding Critical Level	9,788	9,788	0	2*	1	6	0	0
Total number of model receptors	9,788	9,788	179	179	3,851	3,851	418	418
In-Combination Impact (*2042 With Plans – 2042 Future Base*):								
Maximum worsening (µg/m^3)	0.1		0.1		0.1		0.0	
No. receptors worsening >1% criterion	731		74		83		0	

Notes:

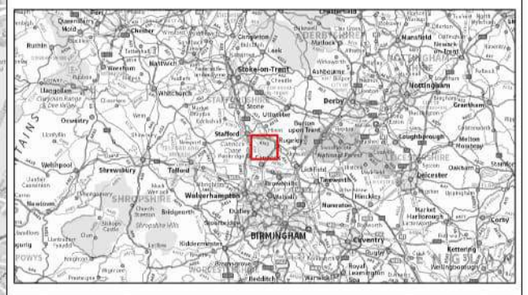
* Both receptors modelled to exceed the critical level by <0.01 µg/m^3 at the SAC boundary closest to the A5 Watling Street.

Legend

Modelled Roads (HRA)

Ammonia (NH_3) Concentration Impact as % of Critical Level
Critical Level = 1 µg/m³

- Deterioration ≤ 1%
- Deterioration > 1%



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Drawing Title

Figure 5.1 Modelled annual mean NH_3 in-combination impact (2042) as a percentage of the relevant critical level
Cannock Chase SAC/SSSI

Project Stage			
n/a			
Status: n/a	Status Description: n/a		
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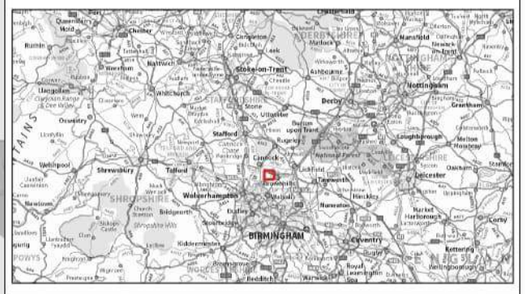
Legend

Modelled Roads (HRA)

Ammonia (NH_3) Concentration Impact as % of Critical Level
Critical Level = 3 µg/m³

- Deterioration ≤ 1%
- Deterioration > 1%



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Drawing Title

Figure 5.2 Modelled annual mean NH_3 in-combination impact (2042) as a percentage of the relevant critical level
Cannock Extension Canal SAC/SSSI

Project Stage			
n/a			
Status: n/a	Status Description: n/a		
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Drawing Number: 65209859-SWE-XX-XX-D-AQ-0005

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Modelled Roads (HRA)

Ammonia (NH_3) Concentration Impact as % of Critical Level
Critical Level = 3 µg/m³

- Deterioration ≤ 1%
- Deterioration > 1%

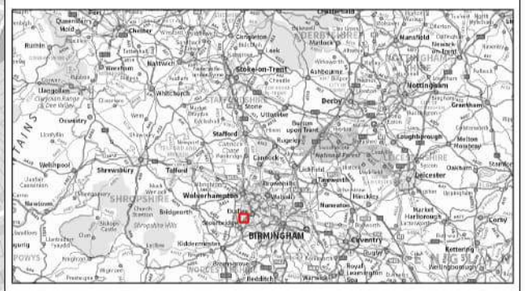

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Figure 5.3 Modelled annual mean NH_3 in-combination impact (2042) as a percentage of the relevant critical level
Fens Pools SAC/SSSI

Project Stage			
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Status: n/a	Status Description: n/a		
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Sheet Size: A3	Scale: 1:5,000	Sweco Ref: 65209859	Revision: P01.1
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0 0.3 0.6 km

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5.4 Nitrogen Deposition

A summary of the predicted changes in annual N deposition rates at all modelled receptor points within each relevant European site is presented in **Table 11**. The maximum modelled in-combination impacts at each distance interval are presented in **Appendix C** (Table C3) and the corresponding contour plots showing the area of exceedance above the 1% significance screening criterion for each European site are depicted in **Figures 6.1 to 6.3**.

The results reported in **Table 11** demonstrate that a number of the European sites are expected to exceed the relevant critical loads in both the 2042 Alternative Future Baseline and 2042 With Partnership Local Plans, owing to existing high background levels (see **Section 4**). Similarly, as visualised in the aforementioned figures, an extensive area within Cannock Extension Canal SAC is predicted to experience an in-combination impact above the 1% criterion.

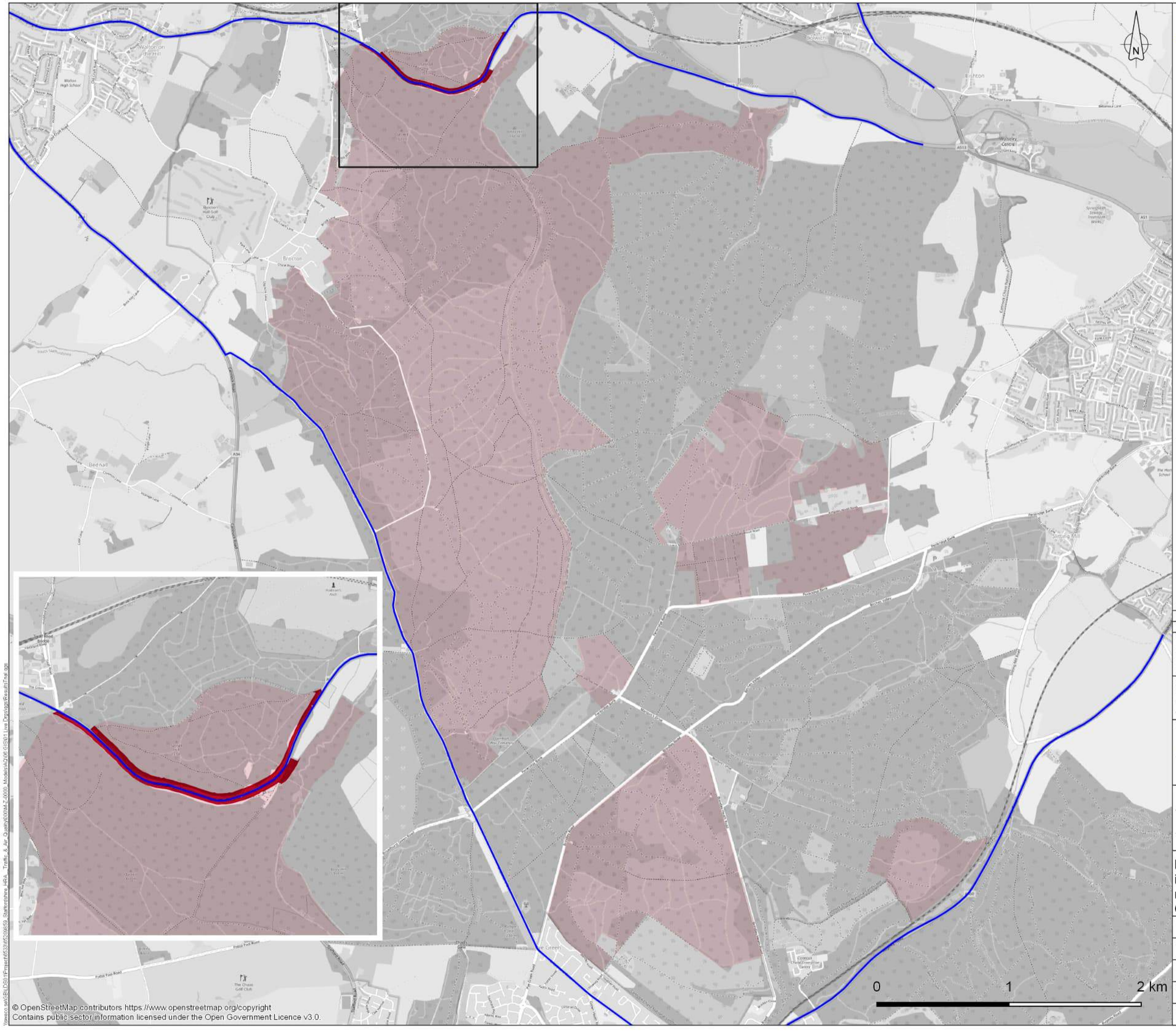
On a site-specific basis, the following applies:

- **Cannock Chase SAC** – From a total of 9,788 modelled receptors, 310 were modelled to exceed the 1% significance screening criterion for in-combination impacts. These are all focussed within a 40 m band either side of the A513 (RAP 1). The entire site is reported to exceed the lower critical load (10 kgN/ha/yr) in both the Future Baseline and With Plans scenarios.
- **Cannock Extension Canal SAC** – Approximately 50% of the SAC area was modelled to experience an in-combination impact above the 1% significance screening criterion, encompassing the entirety of the SAC between the south of A5 Watling Street (RAP 10) and north of Lime Lane (RAP 11). In addition, in-combination impacts above the criterion were modelled for the area of the SAC within 200 m to the south of where Lime Lane intersects the SAC. The entire site is reported to exceed the lower critical load (10 kgN/ha/yr) in both the Future Baseline and With Plans scenarios.
- **Fens Pools SAC** – Approximately 10% of the SAC area reported an in-combination impact above the 1% criterion, focussed within 70 m to the south of the A4101 High Street (RAP 12). Additional in-combination impacts above the 1% criterion were modelled up to 20 m within the SAC adjacent to the east of Tennyson Street. The entire site is reported to exceed the lower critical load (10 kgN/ha/yr) in both the Future Baseline and With Plans scenarios.
- **Pasturefields Salt Marsh SAC** – The maximum modelled annual N deposition rate (17.6 kgN/ha/yr) applies to both the Future Baseline and With Plans scenarios and is below the relevant lower critical load (20 kgN/ha/yr). There were no modelled in-combination impacts above the 1% criterion.

Based on the above, with the exception of Pasturefields Salt Marsh SAC, further Appropriate Assessment of the Partnership Authorities emerging Local Plans in-combination impacts is required by the appointed qualified ecologist.

Table 11: Summary of modelled annual N deposition rates and in-combination impacts *(2042 Alternative Future Baseline vs 2042 With Partnership Local Plans*)

Parameter	Cannock Chase SAC		Cannock Extension Canal SAC		Fens Pools SAC		Pasturefields Salt Marsh SAC	
	Future Base	With Plans	Future Base	With Plans	Future Base	With Plans	Future Base	With Plans
Max. Road Contribution (*Model*) (kgN/ha/yr)	3.3	3.6	6.0	6.8	7.1	8.0	0.2	0.2
Max. Total Concentration (*Model* + *Background*) (kgN/ha/yr)	32.3	32.7	21.5	22.3	22.0	22.8	17.6	17.6
Critical Load (kgN/ha/yr)	**10**		**10**		**10**		**20**	
Number of receptors exceeding Critical Load	9,788	9,788	179	179	3,851	3,851	0	0
Total number of model receptors	9,788	9,788	179	179	3,851	3,851	418	418
In-Combination Impact (*2042 With Plans – 2042 Future Base*):								
Maximum worsening (kgN/ha/yr)	0.4		0.8		0.8		0.0	
No. receptors worsening >1% criterion	310		89		396		0	



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Drawing Title
Figure 6.1 Modelled annual Nitrogen Deposition rate in-combination impact (2042) as a percentage of the relevant lower critical load
Cannock Chase SAC/SSSI

Project Stage			
n/a			
Status: n/a	Status Description: n/a		
Drawn: LFS	Designed: LFS	Checked: DP	Approved: DP
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Legend

Modelled Roads (HRA)

Nitrogen Deposition Rate Impact as a % of Lower Critical Load
Lower Critical Load = 10 kg N/ha/yr

Deterioration ≤ 1%

Deterioration > 1%

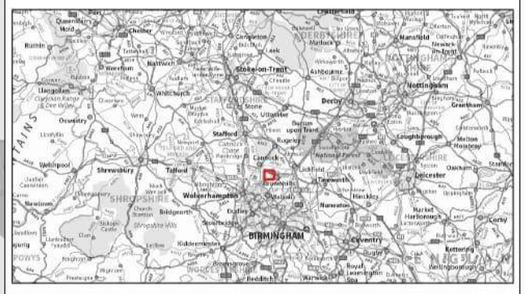

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Figure 6.2 Modelled annual Nitrogen Deposition rate in-combination impact (2042) as a percentage of the relevant lower critical load
Cannock Extension Canal SAC/SSSI

Project Stage: n/a			
Status: n/a	Status Description: n/a		
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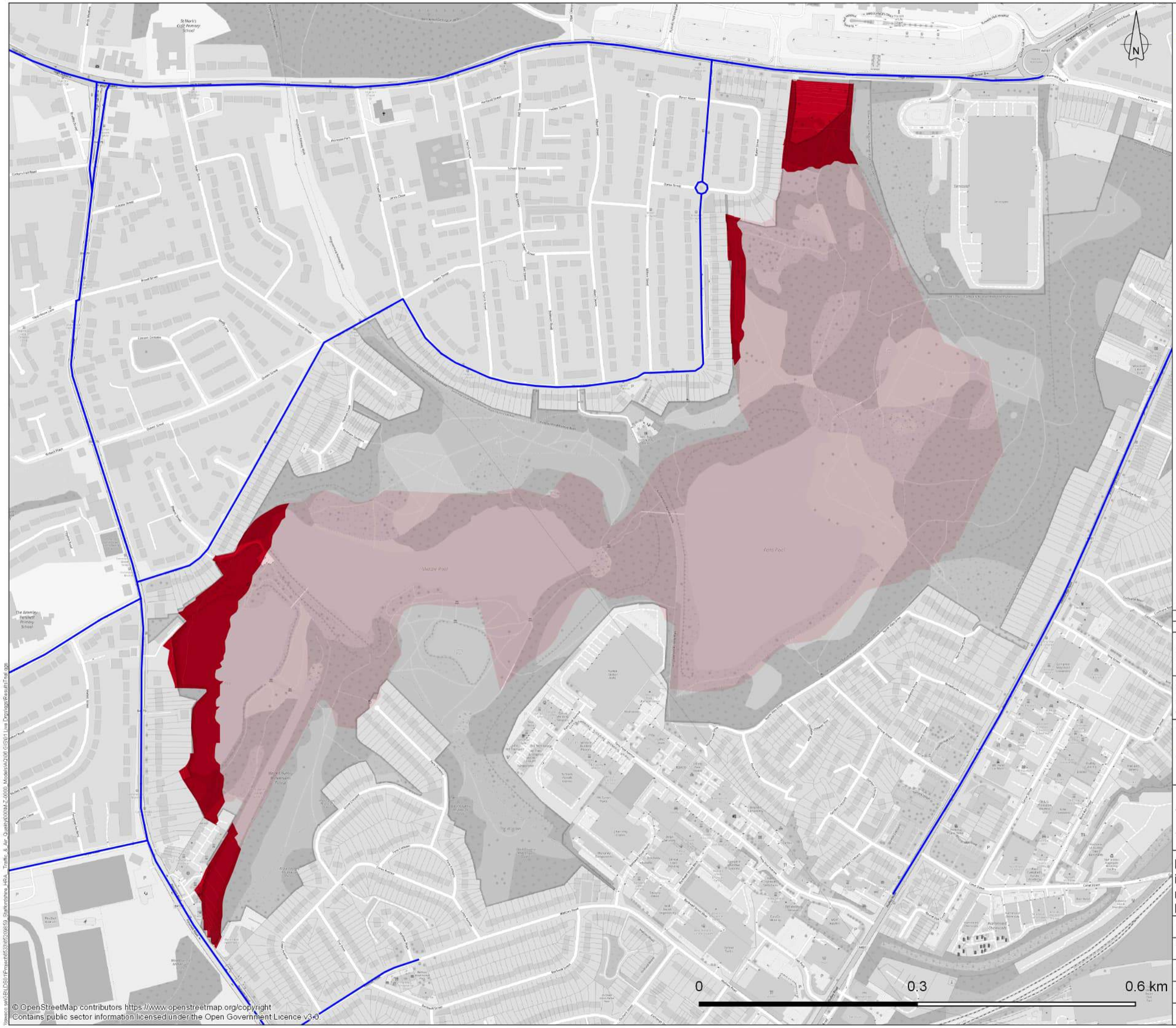


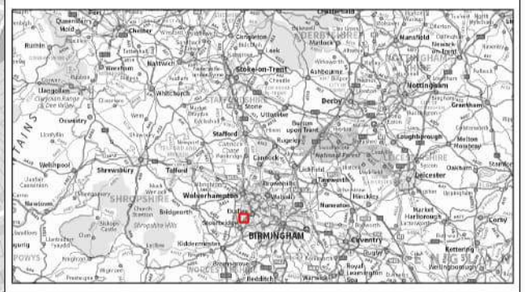
Legend

Modelled Roads (HRA)

Nitrogen Deposition Rate Impact as a % of Lower Critical Load

Lower Critical Load = 10 kg N/ha/yr

- Deterioration ≤ 1%
- Deterioration > 1%



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Drawing Title

Figure 6.3 Modelled annual Nitrogen Deposition rate in-combination impact (2042) as a percentage of the relevant lower critical load

Fens Pools SAC/SSSI

Project Stage			
n/a			
Status: n/a	Status Description: n/a		
Drawn: LFS	Designed: LFS	Checked: DP	Approved: DP
Sheet Size: A3	Scale: 1:5,000	Sweco Ref: 65209859	Revision: P01.1

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5.5 Acid Deposition

A summary of the predicted changes in annual acid (N) deposition rates at all modelled receptor points within Cannock Chase SAC is presented in **Table 12** . The maximum modelled in-combination impacts at each distance interval are presented in **Appendix C** (Table C4) and the corresponding contour plot showing the area of exceedance above the 1% significance screening criterion is depicted in **Figure 7**.

Table 12: Summary of modelled annual acid (N) deposition rates and in-combination impacts *(2042 Alternative Future Baseline vs 2042 With Partnership Local Plans*)

Parameter	Cannock Chase SAC	
	Future Base	**With Plans**
Max. Road Contribution (*Model*) (keqN/ha/yr)	0.234	0.260
Max. Total Concentration (*Model* + *Background*) (keq/ha/yr)	2.581	2.607
Critical Load (keqN/ha/yr)	**1.285**	
Number of receptors exceeding Critical Load	9,788	9,788
Total number of model receptors	9,788	9,788
Maximum worsening (keqN/ha/yr)	0.03	
No. receptors worsening >1% criterion	127	

The results reported in **Table 12** demonstrate that there is an extensive exceedance of the lower critical load within Cannock Chase SAC, both in the 2042 Future Baseline and 2042 With Partnership Local Plans scenarios. However, the area of in-combination impact above the 1% criterion is relatively marginal within Cannock Chase SAC.

From a total of 9,788 modelled receptors, 127 were modelled to exceed the 1% significance screening criterion for in-combination impacts, exclusively located directly adjacent to the A513 (RAP 1) that passes through the northern area of the SAC. All of the SAC is expected to exceed the lower critical load (1.285 keqN/ha/yr) in both the Future Baseline and With Plans scenarios, given that the baseline acid deposition rate is 1.3 keg/ha/yr as a minimum (see **Table 6**).

Based on the above, further Appropriate Assessment of the Partnership Authorities emerging Local Plans in-combination impacts is required by the appointed qualified ecologist.

Legend

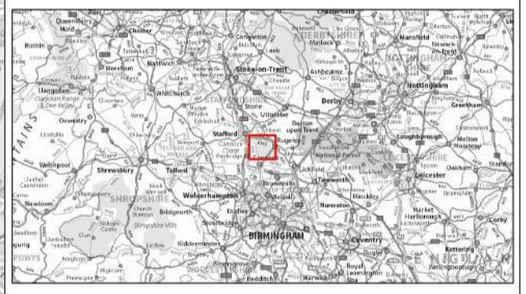
Modelled Roads (HRA)

Acid Deposition Rate Impact as a % of Critical Load

Critical Load = 1.285 keq/ha/yr

Deterioration ≤ 1%

Deterioration > 1%



Rev	06.11.2024	FIRST ISSUE	ABC	ABC	ABC
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Client

South Staffordshire Council

Project Title

Assessment of Air Quality Impacts on European Sites in Staffordshire, Wolverhampton, Walsall, Sandwell, and Dudley

Drawing Title

Figure 7.1 Modelled annual mean Acid Deposition rate in-combination impact (2042) as a percentage of the relevant critical load

Cannock Chase SAC/SSSI

Project Stage			
n/a			
Status: n/a	Status Description: n/a		
Drawn: LFS	Designed: LFS	Checked: DP	Approved: DP
Sheet Size: A3	Scale: 1:27,500	Sweco Ref: 65209859	Revision: P01.1

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6 Summary & Conclusions

A detailed air quality assessment has been completed to consider the potential in-combination impacts of the proposed Partnership Authorities emerging Local Plans on potentially sensitive European sites within the region, namely:

- Cannock Chase SAC
- Pasturefields Salt Marsh SAC
- Midlands Meres and Mosses Phase 2 Ramsar site (Cop Mere & Oakhanger Moss)
- Cannock Extension Canal SAC
- Fens Pools SAC.

This assessment has been informed by the outputs of a transport modelling study[3] to determine the level of change in traffic flows associated with the respective adopted and emerging Local Plans on identified key road links within 200 m of the relevant European sites. The traffic data were provided for two future year scenarios, which formed the basis for the assessment of in-combination impacts:

- **2042 Alternative Future Baseline**
- **2042 With Partnership Local Plans**

The difference in vehicle flows on the key road links between the above scenarios were screened with reference to Natural England guidance[12] to determine which links and European sites / land parcels were included in the air quality model. This identified that both Cop Mere and Oakhanger Moss[21] could be screened out of the air quality modelling assessment.

The scope of the air quality modelling assessment aligned with the brief agreed in writing with Natural England prior to works progressing[1,2]. The focus of the assessment was to consider the in-combination changes to ambient NO_x and NH_3 concentrations, as well as nitrogen and acid deposition rates, at qualifying sensitive habitats. The relevant assessment benchmarks used in this study were based on statutory critical levels and/or habitat-specific critical levels and critical loads, as per the brief[1] agreed with Natural England.

Prior to completing the future year modelling assessment, a review of baseline information was completed to understand existing and future background conditions at and near to the European sites. This entailed a review of published background pollutant concentration and deposition data for each European site, sourced from Defra and APIS. In addition, project-specific baseline monitoring data for NO_2 and NH_3 concentrations in proximity to Cannock Chase SAC and Pasturefields Salt Marsh SAC were provided by the Partnership Authorities to supplement the baseline review.

The baseline review identified that:

- Annual mean NO_x concentrations are expected to remain demonstrably below the annual mean critical level (30 µg/m^3) at all European sites.
- The annual mean NH_3 background concentrations exceed the relevant critical levels at Cannock Chase SAC and Oakhanger Moss with the remaining sites being below.
- Whilst the NH_3 background at Pasturefields Salt Marsh SAC is below the critical level (3 µg/m^3), the monitored concentrations in 2022 and 2023 indicate the potential for it to be currently exceeded.
- Background N deposition rates in both the baseline and future years are projected to exceed the respective lower critical loads at each European site / land parcel, with the exception of Pasturefields Salt Marsh SAC, for which baseline N deposition is marginally below the lower critical load.

- Background acid (N) deposition at Cannock Chase SAC – the only European site screened into the assessment that is sensitive to acid deposition – is reported to exceed the lower critical load.

A Baseline (2022) air quality model scenario was completed to facilitate model verification against relevant roadside air quality monitoring locations, such that appropriate adjustment of the model outputs could be applied, and model performance analysed with reference to Defra guidance[11]. The verified model performed within the ideal statistical parameters and was considered suitable for modelling the future year (2042) scenarios.

The key outcomes of the dispersion modelling, pertaining to the in-combination impacts calculated as the difference in air pollutant concentrations / deposition rates between the 2042 Alternative Future Baseline and 2042 With Partnership Local Plans scenarios, are as follows:

- Although the **annual mean NO_x** results report the potential for in-combination impacts above the 1% significance screening criterion within Cannock Chase SAC, Cannock Extension Canal SAC, and Fens Pools SAC, the maximum annual mean concentrations in all sites are predicted to remain below the critical level in the 2042 With Partnership Local Plans scenario.
- The **annual mean NH_3** results confirm that in-combination impacts above the 1% significance screening criterion occur within all sites except for Pasturefields Salt Marsh SAC. Annual mean NH_3 levels within Cannock Chase SAC are expected to exceed the critical level in both the Future Baseline and With Plans scenarios. Whilst the majority of Cannock Extension Canal SAC and Fens Pools SAC are predicted to remain below the relevant critical level, there are isolated exceedances or near-exceedances in the With Plans scenario.
- The **Nitrogen deposition** results confirm that in-combination impacts above the 1% significance screening criterion occur within all sites except for Pasturefields Salt Marsh SAC. Similarly, with the exception of Pasturefields Salt Marsh SAC, annual N deposition rates exceed the respective lower critical loads within all sites in both scenarios, principally due to high background levels.
- The **Acid (N) deposition** results confirm that in-combination impacts above the 1% significance screening criterion occur within Cannock Chase SAC, albeit the impacts are limited to roadside locations. Annual acid deposition rates are expected to exceed the lower critical load in both the Future Baseline and With Plans scenarios across the entire SAC due to background acid deposition rates being above the lower critical load.

The dispersion modelling study has identified that all European sites, except for Pasturefields Salt Marsh SAC, are predicted to experience in-combination impacts above the 1% significance screening criterion for NH_3 concentrations, N deposition rates, and acid (N) deposition rates. In some cases, the modelled areas of the respective sites exceeding the 1% criterion are extensive.

As a result, this study concludes that **a further Appropriate Assessment of the Partnership Authorities' emerging Local Plans, in terms of in-combination impacts, is necessary and should be conducted by a suitably qualified ecologist**. The full and detailed results of this assessment have been provided to the Partnership Authorities.

This air quality assessment has been completed with reference to relevant Natural England and IAQM guidance, and within the context of the applicable limitations and assumptions, as per **Section 3**. Given the potential for material changes to the Partnership Authorities' emerging Local Plans, this air quality model and assessment report may be subject to future revisions.

Appendix A Traffic Data Tables

This section contains the following table:

Table A1: Traffic flow data relating to 2022 Baseline, 2042 Alternative Baseline, and 2042 With Partnership Local Plans scenarios used in the air quality modelling

Table A1: Traffic flow data relating to 2022 Baseline, 2042 Alternative Baseline, and 2042 With Partnership Local Plans scenarios used in the air quality modelling

Air Quality Model Link ID	Relevant Designated Site	2022 Baseline & 2042 Alternative Baseline		2042 With Partnership Local Plans*	
		Total AADT	HDV AADT	Total AADT	HDV AADT
110399_514326_1	Cannock Chase SAC	12,161	469	14,117	488
110411_512028_1	Cannock Chase SAC	5,006	77	5,837	80
512026_512027_1	Cannock Chase SAC	5,051	77	6,167	80
512027_512028_1	Cannock Chase SAC	5,051	77	6,167	80
514990_514993_1	Cannock Chase SAC	13,047	469	15,269	488
110411_5100228_1	Cannock Chase SAC	3,224	69	3,619	74
512070_512072_1	Cannock Chase SAC	11,746	352	13,801	366
101887_102675_2	Cannock Chase SAC	10,529	223	11,825	234
101887_5100228_1	Cannock Chase SAC	15,063	139	17,078	145
101887_102675_3	Cannock Chase SAC	10,529	223	11,825	234
101887_102675_4	Cannock Chase SAC	10,529	223	11,825	234
102212_102675_2	Cannock Chase SAC	9,128	739	10,222	769
101887_102675_5	Cannock Chase SAC	10,529	223	11,825	234
102666_107910_1	Cannock Extension Canal SAC	5,918	238	6,729	248
108013_102666_1	Cannock Extension Canal SAC	6,338	85	7,409	88
107909_108012_1	Cannock Extension Canal SAC	28,912	4,207	32,790	4,333
102666_108012_1	Cannock Extension Canal SAC	14,534	2,026	16,529	2,107
109642_108964_1	Cannock Extension Canal SAC	23,357	2,417	26,228	2,514
102666_114315_1	Cannock Extension Canal SAC	13,741	2,075	15,633	2,194
109641_109617_1	Cannock Extension Canal SAC	20,372	2,063	22,858	2,146
102666_108013_1	Cannock Extension Canal SAC	9,921	135	11,357	140
102704_108013_1	Cannock Extension Canal SAC	10,841	184	12,381	191
108013_108014_1	Cannock Extension Canal SAC	11,300	261	13,365	272
102666_108012_2	Cannock Extension Canal SAC	28,834	4,015	32,783	4,176
108012_102666_1	Cannock Extension Canal SAC	14,300	1,989	16,254	2,069
102666_107910_2	Cannock Extension Canal SAC	9,258	306	10,538	318
107910_102666_1	Cannock Extension Canal SAC	3,340	68	3,809	70
102666_108013_2	Cannock Extension Canal SAC	16,259	219	18,766	228
102666_114315_2	Cannock Extension Canal SAC	27,863	4,207	31,642	4,392
114315_102666_1	Cannock Extension Canal SAC	14,122	2,132	16,009	2,198
1_AB_1	Cannock Extension Canal SAC	8,647	2,804	9,908	2,917
1_BC_1	Cannock Extension Canal SAC	20,570	2,057	23,450	2,142
1_CD_1	Cannock Extension Canal SAC	22,257	2,082	25,374	2,168
1_DE_1	Cannock Extension Canal SAC	14,872	766	16,977	788
1_EF_1	Cannock Extension Canal SAC	24,334	2,233	27,683	2,302
1_FG_1	Cannock Extension Canal SAC	19,003	2,744	21,583	2,833
1_GH_1	Cannock Extension Canal SAC	20,399	2,776	23,317	2,867
1_HA_1	Cannock Extension Canal SAC	13,321	1,491	15,229	1,541

Air Quality Model Link ID	Relevant Designated Site	2022 Baseline & 2042 Alternative Baseline		2042 With Partnership Local Plans*	
		Total AADT	HDV AADT	Total AADT	HDV AADT
101537_101548_1	Fens Pools SAC	12,175	128	13,348	133
101478_107217_1	Fens Pools SAC	5,918	68	6,592	71
107217_107219_1	Fens Pools SAC	10,717	96	11,785	100
101519_107217_1	Fens Pools SAC	16,233	164	17,757	170
101537_107219_1	Fens Pools SAC	11,237	144	12,663	150
107218_107219_1	Fens Pools SAC	5,245	58	5,830	60
101519_110607_1	Fens Pools SAC	10,064	95	10,891	99
101619_113158_1	Fens Pools SAC	24,372	1,030	26,823	1,071
101519_513072_1	Fens Pools SAC	6,169	69	6,867	71
101609_513085_1	Fens Pools SAC	6,169	69	6,867	71
513072_513085_1	Fens Pools SAC	6,169	69	6,867	71
101619_513086_1	Fens Pools SAC	18,304	779	20,125	810
101537_514545_1	Fens Pools SAC	7,558	59	8,362	62
101609_513082_1	Fens Pools SAC	6,169	69	6,867	71
110340_513027_1	Fens Pools SAC	18,581	285	20,629	296
513026_513027_1	Fens Pools SAC	18,581	285	20,629	296
101710_513028_1	Fens Pools SAC	19,525	441	21,556	458
101619_514575_1	Fens Pools SAC	6,169	69	6,867	71
513029_513082_1	Fens Pools SAC	6,167	69	6,866	73
513029_514575_1	Fens Pools SAC	6,167	69	6,866	73
101512_101516_1	Fens Pools SAC	6,247	142	6,876	147
101509_101512_1	Fens Pools SAC	9,864	192	10,807	200
101516_513084_1	Fens Pools SAC	18,304	779	20,125	810
101505_514544_1	Fens Pools SAC	21,244	476	23,232	495
101505_513083_1	Fens Pools SAC	20,076	537	22,047	559
514543_101505_1	Fens Pools SAC	5,855	56	6,494	58
101512_514543_1	Fens Pools SAC	5,855	56	6,494	58
101509_110607_1	Fens Pools SAC	10,208	207	11,183	216
513084_520411_1	Fens Pools SAC	18,304	779	20,125	810
513086_520411_1	Fens Pools SAC	18,304	779	20,125	810
514575_513029_1	Fens Pools SAC	2,611	16	2,913	16
513029_514575_2	Fens Pools SAC	6,167	69	6,866	73
513029_514575_3	Fens Pools SAC	3,556	53	3,953	57
5100230_5100231_1	Cop Mere (Ramsar)	652	31	704	32
101057_5100234_1	Cop Mere (Ramsar)	2,953	126	3,277	131
5100230_5100231_2	Cop Mere (Ramsar)	652	31	704	32
5100230_5100231_3	Cop Mere (Ramsar)	652	31	704	32
5100230_5100231_4	Cop Mere (Ramsar)	652	31	704	32
101057_5100234_3	Cop Mere (Ramsar)	2,953	126	3,277	131
100775_100940_1	Oakhanger Moss (Ramsar)	64,578	13,691	68,062	14,238

Air Quality Model Link ID	Relevant Designated Site	2022 Baseline & 2042 Alternative Baseline		2042 With Partnership Local Plans*	
		Total AADT	HDV AADT	Total AADT	HDV AADT
100940_100775_1	Oakhanger Moss (Ramsar)	64,169	12,705	67,860	13,485
102212_102675_1	Pasturefields Salt Marsh SAC	9,128	739	10,222	769
101887_102675_1	For Model Verification Only	5,128	111	-	-
101060_101058_1	For Model Verification Only	5,292	262	-	-
102911_105358_1	For Model Verification Only	6,082	134	-	-
102911_102890_1	For Model Verification Only	7,710	178	-	-
102855_102890_1	For Model Verification Only	10,457	166	-	-
101529_101494_1	For Model Verification Only	10,725	550	-	-
101494_101424_1	For Model Verification Only	16,075	1,014	-	-
101440_101424_1	For Model Verification Only	6,872	170	-	-
101351_101424_1	For Model Verification Only	11,361	645	-	-
101424_101058_1	For Model Verification Only	2,548	334	-	-
101060_101293_1	For Model Verification Only	5,106	187	-	-
101098_101057_1	For Model Verification Only	1,890	147	-	-
101489_107227_1	For Model Verification Only	12,255	92	-	-
101463_101489_1	For Model Verification Only	13,984	364	-	-
101594_110060_1	For Model Verification Only	9,515	90	-	-
110060_1000215_1	For Model Verification Only	12,057	83	-	-
101583_111234_1	For Model Verification Only	3,993	21	-	-
101612_111235_1	For Model Verification Only	9,716	39	-	-
101594_111235_1	For Model Verification Only	10,854	12	-	-
110060_113992_1	For Model Verification Only	14,504	155	-	-
101583_521124_1	For Model Verification Only	9,902	126	-	-
101612_521124_1	For Model Verification Only	9,902	126	-	-
101612_521126_1	For Model Verification Only	7,702	49	-	-
110060_521126_1	For Model Verification Only	8,140	49	-	-
102890_514328_1	For Model Verification Only	5,844	180	-	-
514328_520765_1	For Model Verification Only	11,746	352	-	-
514327_520765_1	For Model Verification Only	11,746	352	-	-
512064_102890_1	For Model Verification Only	3,404	111	-	-
515133_515135_1	For Model Verification Only	25,198	442	-	-
515132_101887_1	For Model Verification Only	12,253	253	-	-
515132_515133_1	For Model Verification Only	12,586	211	-	-
101489_513083_1	For Model Verification Only	20,076	537	-	-
101612_513043_1	For Model Verification Only	9,509	98	-	-
101617_513043_1	For Model Verification Only	9,141	108	-	-
105358_515064_1	For Model Verification Only	3,102	78	-	-
515064_515127_1	For Model Verification Only	6,082	134	-	-
513015_5100222_1	For Model Verification Only	9,182	129	-	-
101583_5100222_1	For Model Verification Only	9,182	129	-	-

Air Quality Model Link ID	Relevant Designated Site	2022 Baseline & 2042 Alternative Baseline		2042 With Partnership Local Plans*	
		Total AADT	HDV AADT	Total AADT	HDV AADT
5100228_101887_1	For Model Verification Only	7,534	79	-	-
101060_5100231_1	For Model Verification Only	4,769	108	-	-
5100234_101057_1	For Model Verification Only	1,484	60	-	-
100896_515077_1	For Model Verification Only	5,631	381	-	-
105357_512070_1	For Model Verification Only	11,746	352	-	-
102206_103258_1	For Model Verification Only	7,066	687	-	-
107909_115403_1	For Model Verification Only	28,996	3,915	-	-
107909_514987_1	For Model Verification Only	7,084	220	-	-
107910_520644_1	For Model Verification Only	4,738	162	-	-
514883_520644_1	For Model Verification Only	4,738	162	-	-
102675_101887_1	For Model Verification Only	5,401	112	-	-
101887_515132_1	For Model Verification Only	12,218	225	-	-
101887_515132_2	For Model Verification Only	12,218	225	-	-
101887_5100228_2	For Model Verification Only	7,529	60	-	-
101887_515132_3	For Model Verification Only	12,218	225	-	-
515132_101887_2	For Model Verification Only	12,253	253	-	-
101887_515132_4	For Model Verification Only	12,218	225	-	-
102890_102855_1	For Model Verification Only	9,133	126	-	-
102855_102890_2	For Model Verification Only	10,457	166	-	-
102890_512064_1	For Model Verification Only	2,552	110	-	-
102890_512064_2	For Model Verification Only	2,552	110	-	-
102890_514328_2	For Model Verification Only	5,844	180	-	-
102890_102911_1	For Model Verification Only	7,915	185	-	-
102911_515095_1	For Model Verification Only	8,948	287	-	-
102911_105358_2	For Model Verification Only	6,082	134	-	-
515064_105358_1	For Model Verification Only	3,067	56	-	-
105358_515064_2	For Model Verification Only	3,102	78	-	-
105358_515064_3	For Model Verification Only	3,102	78	-	-
101058_101424_1	For Model Verification Only	2,765	359	-	-
101424_101058_2	For Model Verification Only	2,548	334	-	-
101424_101440_1	For Model Verification Only	6,435	200	-	-
101424_101440_2	For Model Verification Only	6,435	200	-	-
101424_101351_1	For Model Verification Only	11,322	639	-	-
101424_101494_1	For Model Verification Only	14,834	781	-	-
101494_101529_1	For Model Verification Only	11,360	539	-	-
101057_5100234_2	For Model Verification Only	1,469	66	-	-
101058_101060_1	For Model Verification Only	4,835	220	-	-
101058_101060_2	For Model Verification Only	4,835	220	-	-
101058_101424_2	For Model Verification Only	2,765	359	-	-
101058_101424_3	For Model Verification Only	2,765	359	-	-

Air Quality Model Link ID	Relevant Designated Site	2022 Baseline & 2042 Alternative Baseline		2042 With Partnership Local Plans*	
		Total AADT	HDV AADT	Total AADT	HDV AADT
101057_101098_1	For Model Verification Only	1,951	149	-	-
101057_101098_2	For Model Verification Only	1,951	149	-	-
7_AB_1	For Model Verification Only	4,366	486	-	-
7_BC_1	For Model Verification Only	4,827	393	-	-
7_CD_1	For Model Verification Only	5,887	467	-	-
7_DE_1	For Model Verification Only	4,417	251	-	-
7_EF_1	For Model Verification Only	5,939	473	-	-
7_FG_1	For Model Verification Only	3,368	343	-	-
7_GH_1	For Model Verification Only	6,172	499	-	-
7_HA_1	For Model Verification Only	5,049	459	-	-
6_AB_1	For Model Verification Only	10,526	1,264	-	-
6_BC_1	For Model Verification Only	18,678	1,017	-	-
6_CD_1	For Model Verification Only	22,036	1,084	-	-
6_DE_1	For Model Verification Only	12,891	579	-	-
6_EF_1	For Model Verification Only	23,658	1,267	-	-
6_FG_1	For Model Verification Only	22,088	1,169	-	-
6_GH_1	For Model Verification Only	19,692	1,330	-	-
6_HA_1	For Model Verification Only	15,409	917	-	-
3_AB_1	For Model Verification Only	5,576	375	-	-
3_BC_1	For Model Verification Only	15,011	291	-	-
3_CD_1	For Model Verification Only	16,618	347	-	-
3_DE_1	For Model Verification Only	11,894	237	-	-
3_EF_1	For Model Verification Only	16,320	340	-	-
3_FG_1	For Model Verification Only	12,832	253	-	-
3_GH_1	For Model Verification Only	14,835	357	-	-
3_HA_1	For Model Verification Only	9,238	282	-	-
4_AB_1	For Model Verification Only	7,471	112	-	-
4_BC_1	For Model Verification Only	16,072	299	-	-
4_CD_1	For Model Verification Only	12,110	223	-	-
4_DE_1	For Model Verification Only	13,991	275	-	-
4_EF_1	For Model Verification Only	8,173	234	-	-
4_FA_1	For Model Verification Only	11,220	267	-	-
101058_101424_4	For Model Verification Only	2,765	359	-	-
101058_101424_5	For Model Verification Only	2,765	359	-	-

Notes:

* Links that have no traffic flow presented in the *2042 With Partnership Local Plans* scenario were only required in the *2022 Baseline* scenario to support the model verification exercise and were not within 200 m of a European site.

Appendix B Dispersion Modelling Approach & Verification

Dispersion Model Selection

The predicted impacts on air quality at the identified European sites, associated with changes to vehicle emissions as a result of the Partnership Authorities Local Plans, were assessed using Cambridge Environmental Research Consultants (CERC) atmospheric dispersion modelling system for roads (ADMS-Roads v5.0).

ADMS-Roads applies advanced algorithms for the height-dependence of wind speed, turbulence and stability to produce improved predictions of air pollutant concentrations within the given model domain. It can predict long-term and short-term concentrations, as well as calculations of percentile concentrations.

ADMS-Roads is a validated model, developed in the UK by CERC. The model validation process includes comparisons with data from the UK's Automatic Urban Rural Network (AURN) and specific verification exercises using standard field, laboratory and numerical data sets. CERC is also involved in European programmes on model harmonisation, and their models were compared favourably against other EU and U.S. EPA systems. Further information in relation to this is available from the CERC web site at http://www.cerc.co.uk/environmental-software/model-validation.html.

Model Input Parameters

A number of the key model inputs are detailed in **Section 3.3** of the main report, including the model study area, receptor selection, traffic data and associated vehicle emission rates, and treatment of terrain. The below provides details of the other model input parameters applicable to this assessment.

Modelled Road Link Geometry

ADMS-Roads requires inputs of road widths and, where relevant, heights of street canyons, although no street canyons were identified for this study. Road geometries were determined using a combination of OpenStreeMap.org for road centreline geometries and Ordnance Survey Mastermap Topography to refine centreline geometries and determine average road widths for each modelled road link. This enabled the model to reflect real-world conditions as closely as possible.

Surface Roughness

Surface roughness is a parameter used to represent the unevenness of the surface throughout the model domain, which influences the vertical mixing of pollutants through enhancing mechanical turbulence.

The surface roughness length was set to 0.5m across the modelled study area, which is equivalent to parkland and open suburbia land uses. This reflects the mixed nature of the vegetation at roadside and within the European sites.

The meteorological data sourced for this project was representative of a predominantly rural area (open fields). Therefore, the surface roughness length was set to 0.02 m at the meteorological site.

Minimum Monin-Obukhov Length

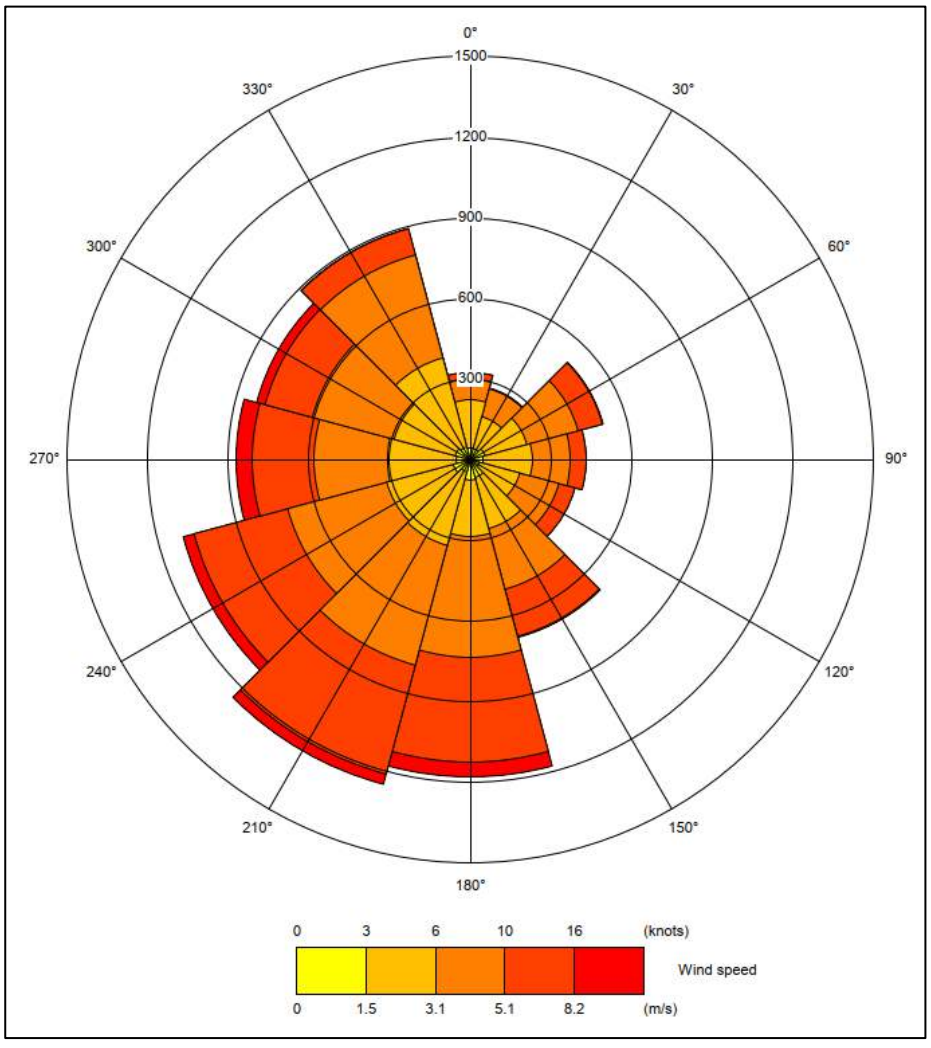
The Monin-Obukhov (MO) length is a measure of the stability of the atmosphere and is used by the model to predict how air will mix near to the ground (i.e. within boundary layer) and how pollutants will disperse. A minimum MO length of 10m was applied uniformly across the modelled study area given the predominantly rural to suburban nature of the study area, which will tend to experience more stable atmospheric conditions compared to built-up urban areas.

Meteorological Data

There were no representative weather monitoring stations within 45 km of the study area. Given the geographical extent of the model area, formatted Numerical Weather Prediction (NWP) data for year 2022 were sourced for a 3 km x 3 km area centred on the former RAF Wheaton airfield at 52.732°N, 2.235°W. This represented an area of flat terrain, predominantly comprising open fields. As such, the NWP data are not likely to be significantly influenced by urban development or other pronounced topographical features.

A wind rose for the 2022 hourly data is presented in **Figure B1**.

Figure B1: Wind rose for 2022 hourly NWP meteorological data



Model Verification & Adjustment

The predicted annual mean NO_2 concentration results from the base year (2022) model scenario were compared with equivalent 2022 monitored results at a number of diffusion tubes sites within Stafford Borough Council, Cannock Chase District Council, and Dudley Metropolitan Borough Council in the modelled study area. With reference to Defra's LAQM.TG22, the majority of modelled concentrations should be within +/-25% of the equivalent monitored value, but ideally within +/10%.

Differences between modelled and measured pollutant concentrations can be caused by a number of factors, including:

- Uncertainties and limitations with meteorological data
- Uncertainties in source activity data such as traffic flow data and vehicle emissions factors
- Estimates of background pollutant concentrations
- Model input parameters such as roughness length, minimum Monin-Obukhov length, and overall model limitations
- The overall limitations with the dispersion model
- Uncertainties associated with monitoring data, including siting.

Model verification is a process that allows these uncertainties to be investigated and, through appropriate adjustment of the modelled road-NO_x contribution, minimised to improve the consistency of modelling results versus available monitored data. Model adjustment factors for road-NO_x derived through this process were applied to all subsequent model scenario outputs.

Model Performance

To evaluate model performance and assess uncertainties, the model results were subjected to statistical analyses to establish confidence in the results being presented, both before and after verification. The statistical parameters assessed comprised:

- The correlation coefficient
- Fractional bias
- Root mean square error (RMSE)

A more detailed description on these statistical parameters is provided in **Table B1** below, taken from LAQM.TG22 Box 7-21.

Table B1: Description of model performance statistics

Statistical Parameter	Description	Ideal Value
Root Mean Square Error (RMSE)	RMSE is used to define the average error or uncertainty of the model. The units of RMSE are the same as the quantities compared. If the RMSE values are higher than 25% of the Objective being assessed, it is recommended that the model inputs and verification should be revisited in order to make improvements. Ideally an RMSE within 10% of the air quality Objective would be derived, which equates to 4 µg/m^3 for the annual mean NO_2 Objective.	0.0 µg/m^3 (or <4.0 µg/m3; 10% of Objective))
Fractional Bias (FB)	It is used to identify if the model shows a systematic tendency to over or under predict. FB values vary between +2 and -2 and has an ideal value of zero. Negative values suggest a model over-prediction and positive values suggest a model under-prediction.	0.0
Correlation Coefficient (CC)	It is used to measure the linear relationship between predicted and observed data. A value of zero means no relationship and a value of 1 means absolute relationship. This statistic can be particularly useful when comparing a large number of model and observed data points.	1.0

Verification Methodology

The verification process involves a review of the modelled pollutant concentrations against corresponding monitoring data to determine how well the air quality model has performed. Depending on the outcome it may be considered that the model has performed adequately and that there is no need to adjust any of the modelled results LAQM.TG22.

Alternatively, the model may perform outside of the ideal performance limits as stated by LAQM.TG22 (i.e. model agrees within +/-25% of monitored equivalent). There is then a need to check all the input data to ensure that it is reasonable and accurately represented in the air quality modelling process.

Where all input data, such as traffic data, emissions rates, and background concentrations have been checked and considered as reasonable, then the modelled results require adjustment to best align with the monitoring data. This may either be a single verification adjustment factor to be applied to the modelled concentrations across the study area, or a range of different adjustment factors to account for different zones in the study area e.g. major roads, local roads.

The air quality model was run to predict the 2022 annual mean road-NO_x contribution at nine roadside diffusion tubes located within the aforementioned Council areas, as presented in **Table B2**. Additional road links were incorporated into the 2022 Baseline traffic network such that a representative spread of monitoring locations could be included in the verification exercise.

Table B2: Details of diffusion tube monitoring locations included in model verification

Site ID	Site Name	Type	OS Grid Coordinates (m)		2022 Annual Mean (µg/m^3)
			X	Y	
Stafford_14	-	Other	390092	333159	18.4
Stafford_13	-	Other	390306	332968	19.9
Stafford_ST	-	Kerbside	390050	333270	27.4
Cannock_A460	A460 Rugeley	Roadside	403008	315932	16.8
Cannock_268 WS	268 Watling Street	Roadside	400726	307423	28.9
Cannock_268 WSB	268 Watling Street B	Roadside	400864	307385	38.7
Dudley_33	High Street, Pensnett	Roadside	390989	289254	25.0
Dudley_33ex	Birds Meadow, Pensnett	Roadside	391027	289410	15.4
Dudley_33Q	High Oak, Pensnett	Roadside	391060	289207	28.7

Modelled versus Monitored Annual Mean NO_2: Before Model Adjustment

The modelled annual mean road-NO_x outputs from the 2022 Base year scenario were converted to total annual mean NO_2 concentrations using Defra's NO_x to NO_2 calculator (v8.1) with the appropriate Defra background NO_2 value accounted for. The total modelled NO_2 annual mean concentrations were then compared to the equivalent 2022 local authority monitored values.

The outcomes of this comparison are summarised in **Table B3.**

Table B3: Initial comparison of modelled and monitored 2022 annual mean NO_2 concentrations (Units: µg/m^3)

Site ID	Modelled road-NO_x	Background NO_2	Total modelled NO_2	Total monitored NO_2	% Difference (model – monitor)
Stafford_14	9.7	9.9	15.3	18.4	-17.1%
Stafford_13	9.2	10.2	15.3	19.9	-23.4%
Stafford_ST	39.7	9.9	30.3	27.4	10.4%
Cannock_A460	7.9	7.7	12.1	16.8	-28.2%
Cannock_268 WS	25.4	13.5	26.7	28.9	-7.7%
Cannock_268 WSB	33.7	13.5	30.7	38.7	-20.6%
Dudley_33	11.0	13.5	19.4	25.0	-22.5%
Dudley_33ex	2.0	13.6	14.7	15.4	-4.5%
Dudley_33Q	9.0	13.3	18.2	28.7	-36.8%

The initial comparison of modelled and monitored NO_2 data in **Table B3** identified that the model was underpredicting at all but one (Stafford_ST) of the nine monitoring locations. Of these eight locations, six were demonstrating predicted annual mean concentrations within 25% of the equivalent monitored value and two within 10%. Sites 'Cannock_A460' and 'Dudley_33Q' returned predicted annual mean concentrations that were 28.2% and 36.8% below the equivalent monitored value.

It was evident that there was an overall tendency for the model to underpredict. This was confirmed by a statistical analysis of the unadjusted model results, which returned a fractional bias of +0.18 and an associated average model uncertainty (RMSE) of 5.5 µg/m^3. As such, it was deemed appropriate to progress verification to compare the modelled and monitored road-NO_x values, such that an appropriate modelled road-NO_x adjustment factor could be derived.

Given the spread of monitoring locations across three local authority areas, zonal verification and adjustment was completed at a local authority scale (i.e. three zones).

Comparison of Road-NO_x Contributions and Model Adjustment

Modelled road-NO_x concentrations at each site were compared with the corresponding monitored road-NO_x values in each verification zone to enable model adjustment factors to be derived.

A summary of the data comparison and derived model adjustment factors is presented in **Table B4**, with the respective plots for each zone presented as **Plates B1 to B3**, respectively.

Table B4: Summary of annual mean road-NO_x comparison and model adjustment factors (Units: µg/m^3)

Site ID	Verification zone	Monitored road-NO_x	Modelled road-NO_x (unadjusted)	Road-NO_x adjustment factor*	Modelled road-NO_x (adjusted)
Stafford_14	**Stafford**	15.7	9.7	0.94	9.2
Stafford_13		18.1	9.2		8.7
Stafford_ST		33.7	39.7		37.5
Cannock_A460	**Cannock**	16.8	7.9	1.42	11.3
Cannock_268 WS		30.0	25.4		36.1
Cannock_268 WSB		51.2	33.7		47.9
Dudley_33	**Dudley**	22.0	11.0	2.52	27.7
Dudley_33ex		3.3	2.0		5.1
Dudley_33Q		29.9	9.0		22.6

Notes:

* Road-NO_x adjustment factor derived from respective y=mx (intercept at 0) plot (dimensionless)

Plate B1: Modelled versus monitored road-NO_x for 'Stafford' verification zone (pre-adjustment)

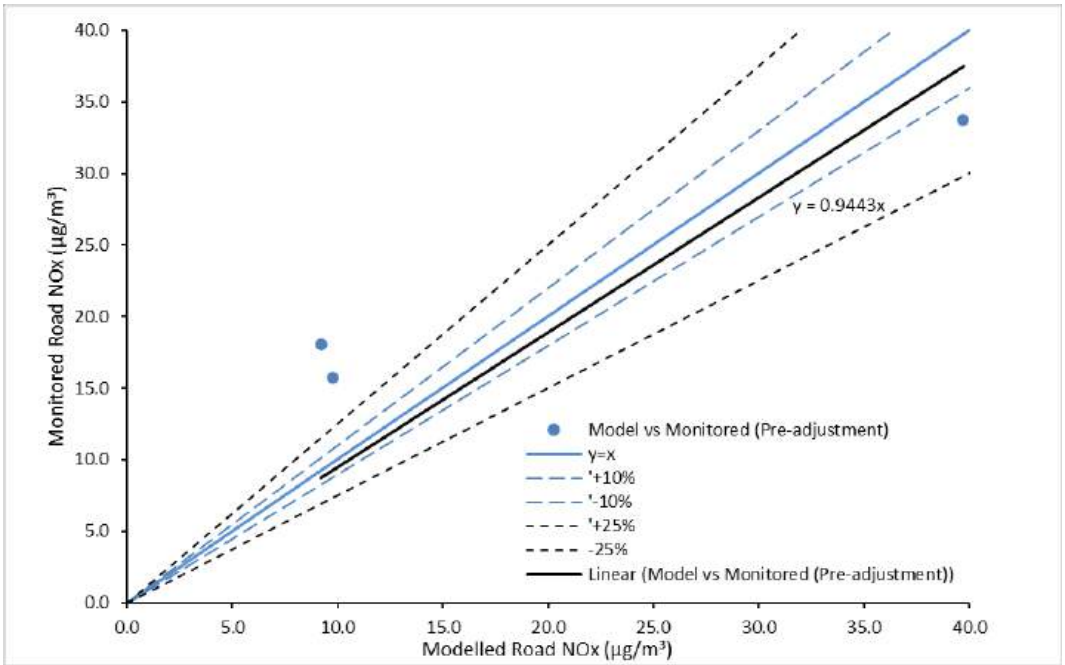


Plate B2: Modelled versus monitored road-NO_x for 'Cannock' verification zone (pre-adjustment)

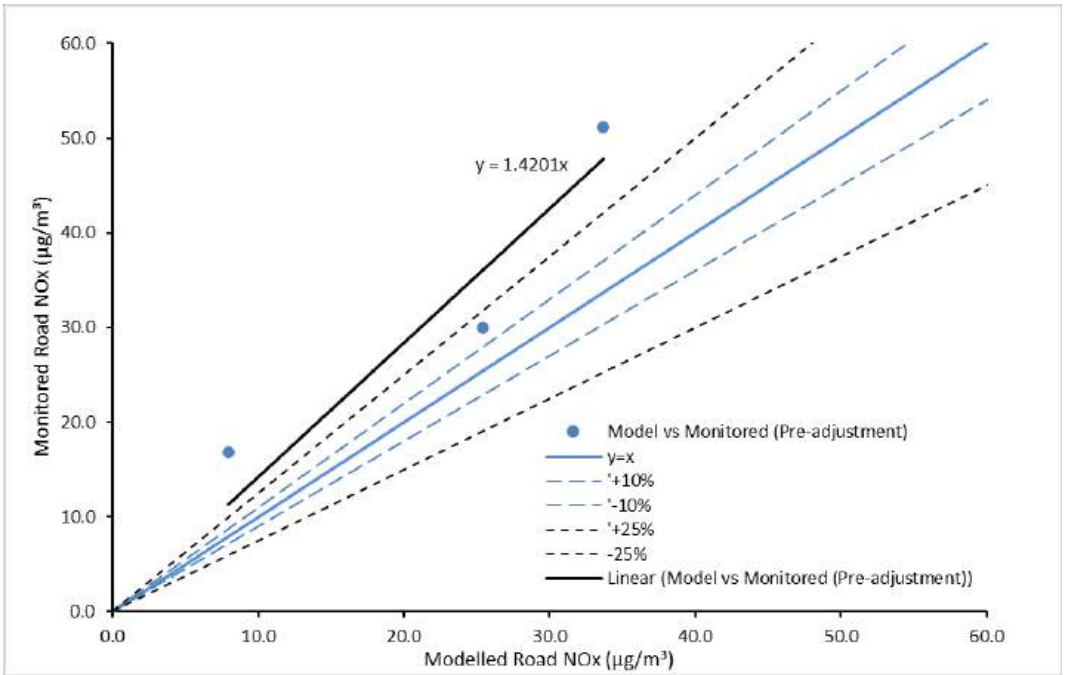
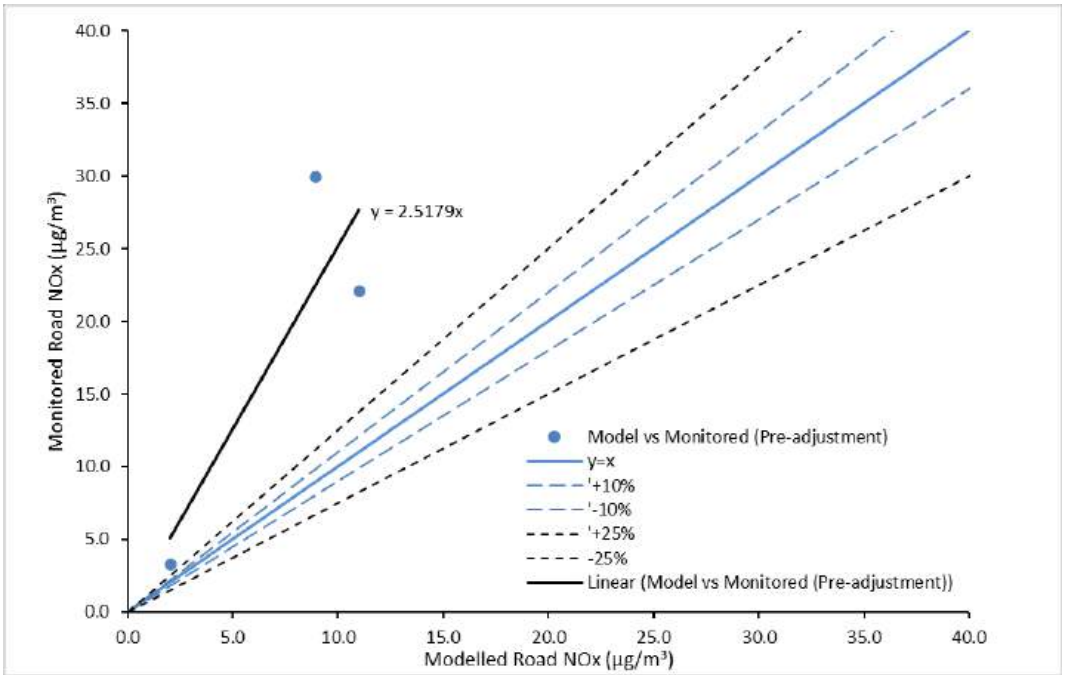


Plate B3: Modelled versus monitored road-NO_x for 'Dudley' verification zone (pre-adjustment)

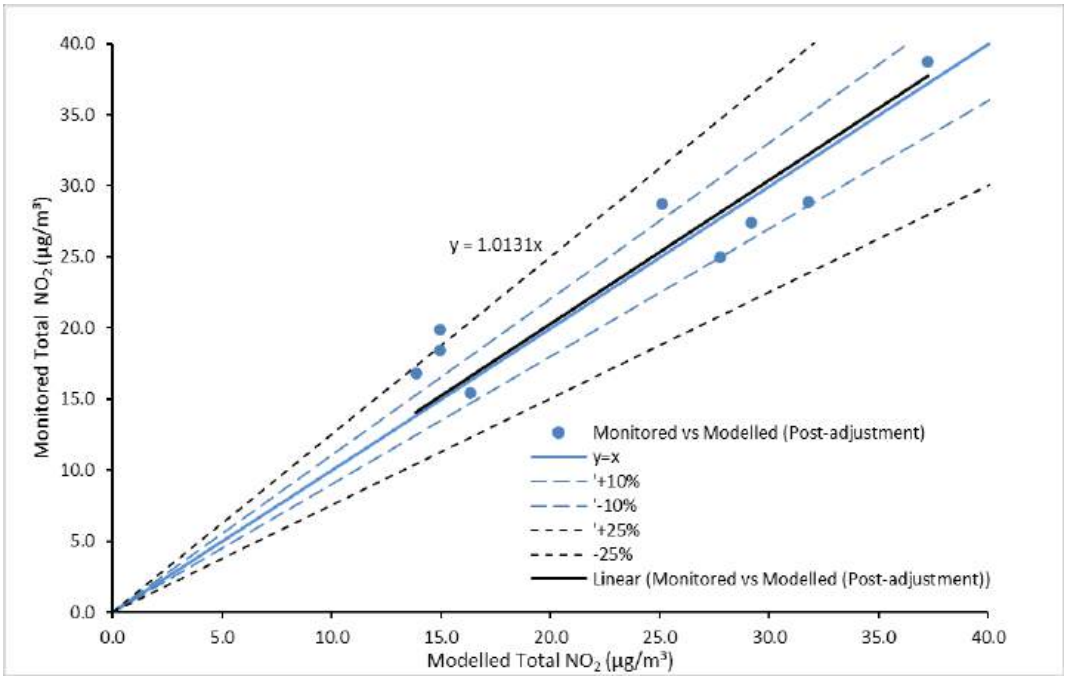


The adjusted annual mean modelled road-NO_x, as per **Table B4**, was subsequently converted to total annual mean NO_2 to allow comparison with the total monitored equivalent at each site. A summary of the adjusted model comparison with the monitored data is provided in **Table B5** and graphically presented in **Plate B4**.

Table B4: Summary of annual mean road-NO_x comparison and model adjustment factors (Units: µg/m³)

Site ID	Verification zone	Monitored NO_2 (µg/m³)	Adjusted Modelled NO_2 (µg/m³)	% Difference	RMSE (µg/m³)	Fractional bias
Stafford_14	**Stafford**	18.4	15.0	-18.7%	3.62	0.11
Stafford_13		19.9	15.0	-24.7%		
Stafford_ST		27.4	29.2	6.6%		
Cannock_A460	**Cannock**	16.8	13.9	-17.4%	2.52	0.02
Cannock_268 WS		28.9	31.8	10.0%		
Cannock_268 WSB		38.7	37.2	-3.8%		
Dudley_33	**Dudley**	25.0	27.8	11.1%	2.68	0.00
Dudley_33ex		15.4	16.4	6.2%		
Dudley_33Q		28.7	25.1	-12.5%		
				All Sites	**2.98**	**0.04**

Plate B4: Total adjusted modelled annual mean NO_2 versus monitored NO_2 at all monitoring sites



Following model adjustment, the modelled annual mean concentrations were all within +/-25%, with six within +/-15%, of the monitored equivalent.

As a whole, the data indicate that the adjusted model performs with no tendency to over or under predict when compared to the local authority monitoring results (fractional bias of 0.04) and the average model uncertainty across the study area was derived to derived to be 2.98 µg/m^3, which is within the ideal statistical tolerances as per LAQM.TG22. This represents a demonstrable improvement in model performance relative to the unadjusted model analysis.

The zonal road-NO_x adjustment factors were subsequently applied to all respective modelled road-NO_x outputs for both the base (2022) and future year (2042) scenarios. The location of each modelled receptor within the respective local authority was used to determine the appropriate adjustment factor to be applied.

Given that the 'Stafford' verification zone adjustment factor was slightly below 1.0 (0.94), an assumed factor of 1.0 was used for the purposes of the assessment, thereby ensuring a relatively conservative approach to deriving road-NO_x and total annual mean NO_2 concentrations at receptors within this zone.

Appendix C Air Quality Assessment Results Tables

This section contains the following tables:

Table C1: Cannock Chase SAC – modelled maximum values at each 10 m interval

Table C2: Cannock Extension Canal SAC – modelled maximum values at each 10 m interval

Table C3: Fens Pools SAC – modelled maximum values at each 10 m interval

Table C4: Pasturefields Salt Marsh SAC – modelled maximum values at each 10 m interval

Table C1: Cannock Chase SAC – modelled maximum values at each 10 m interval

Distance within SAC from road (m)	Maximum Annual Mean NO_x (µg/m^3)				Maximum Annual Mean NH_3 (µg/m^3)				Maximum Nitrogen Deposition Rate (kgN/ha/yr)				Maximum Acid Deposition Rate (keq/ha/yr)			
	2042 Alt Base	2042 With Plans	Difference	Difference as % of CL	2042 Alt Base	2042 With Plans	Difference	Difference as % CL	2042 Alt Base	2042 With Plans	Difference	Difference as % of CL	2042 Alt Base	2042 With Plans	Difference	Difference as % CL
0	12.1	12.6	0.5	**1.7%**	2.7	2.8	0.1	**6.2%**	32.3	32.7	0.4	**3.6%**	2.58	2.61	0.03	**2.0%**
10	9.7	9.9	0.2	0.8%	2.5	2.5	0.0	**2.9%**	31.0	31.3	0.2	**2.3%**	2.49	2.51	0.02	**1.3%**
20	9.0	9.2	0.2	0.6%	2.4	2.4	0.0	**2.0%**	30.3	30.5	0.2	**1.5%**	2.44	2.45	0.01	0.8%
30	9.0	9.0	0.1	0.4%	2.3	2.4	0.0	**1.5%**	30.0	30.1	0.1	**1.1%**	2.41	2.42	0.01	0.6%
40	8.9	9.0	0.1	0.3%	2.3	2.3	0.0	**1.2%**	29.8	29.9	0.1	0.9%	2.40	2.41	0.01	0.5%
50	8.8	8.9	0.1	0.3%	2.3	2.3	0.0	**1.0%**	29.6	29.7	0.1	0.8%	2.39	2.40	0.01	0.4%
60	8.8	8.9	0.1	0.3%	2.3	2.3	0.0	0.9%	29.5	29.6	0.1	0.6%	2.38	2.39	0.00	0.3%
70	8.8	8.8	0.1	0.2%	2.3	2.3	0.0	0.8%	29.5	29.5	0.1	0.5%	2.38	2.38	0.00	0.3%
80	8.7	8.8	0.1	0.2%	2.3	2.3	0.0	0.7%	29.4	29.4	0.1	0.5%	2.37	2.38	0.00	0.3%
90	8.7	8.8	0.1	0.2%	2.3	2.3	0.0	0.7%	29.4	29.4	0.1	0.5%	2.37	2.37	0.00	0.3%
100	8.7	8.7	0.1	0.2%	2.3	2.3	0.0	0.6%	29.3	29.4	0.0	0.4%	2.37	2.37	0.00	0.2%
110	8.6	8.7	0.1	0.2%	2.3	2.3	0.0	0.6%	29.3	29.3	0.0	0.4%	2.37	2.37	0.00	0.2%
120	8.6	8.7	0.1	0.2%	2.3	2.3	0.0	0.6%	29.3	29.3	0.0	0.3%	2.36	2.37	0.00	0.2%
130	8.6	8.7	0.0	0.2%	2.3	2.3	0.0	0.5%	29.3	29.3	0.0	0.3%	2.36	2.37	0.00	0.2%
140	8.6	8.6	0.0	0.2%	2.3	2.3	0.0	0.5%	29.2	29.3	0.0	0.3%	2.36	2.36	0.00	0.2%
150	8.6	8.6	0.0	0.1%	2.3	2.3	0.0	0.5%	29.2	29.3	0.0	0.3%	2.36	2.36	0.00	0.2%
160	8.5	8.6	0.0	0.1%	2.3	2.3	0.0	0.5%	29.2	29.2	0.0	0.3%	2.36	2.36	0.00	0.2%
170	8.5	8.6	0.0	0.1%	2.3	2.3	0.0	0.4%	29.2	29.2	0.0	0.3%	2.36	2.36	0.00	0.2%
180	8.5	8.5	0.0	0.1%	2.3	2.3	0.0	0.4%	29.2	29.2	0.0	0.3%	2.36	2.36	0.00	0.1%
190	8.5	8.5	0.0	0.1%	2.3	2.3	0.0	0.4%	29.2	29.2	0.0	0.3%	2.36	2.36	0.00	0.1%
200	8.5	8.5	0.0	0.1%	2.3	2.3	0.0	0.4%	29.2	29.2	0.0	0.2%	2.36	2.36	0.00	0.1%
Critical Level / Load			**30**				**1**				**10**				**1.285**	

Notes: Exceedances of 1% significance screening criterion are highlighted in **bold**.

Table C2: Cannock Extension Canal SAC – modelled maximum values at each 10 m interval

Distance within SAC from road (m)	Maximum Annual Mean NO_x (µg/m^3)				Maximum Annual Mean NH_3 (µg/m^3)				Maximum Nitrogen Deposition Rate (kgN/ha/yr)			
	2042 Alt Base	2042 With Plans	Difference	Difference as % of CL	2042 Alt Base	2042 With Plans	Difference	Difference as % CL	2042 Alt Base	2042 With Plans	Difference	Difference as % of CL
0	20.6	21.8	1.2	**4.0%**	2.9	3.0	0.1	**4.5%**	21.5	22.3	0.8	**8.0%**
10	19.7	20.6	0.8	**2.8%**	2.6	2.7	0.1	**3.1%**	19.9	20.5	0.6	**5.5%**
20	12.8	13.0	0.2	0.6%	2.0	2.0	0.0	0.7%	16.3	16.5	0.1	**1.3%**
30	12.3	12.4	0.1	0.4%	1.9	2.0	0.0	0.5%	16.0	16.1	0.1	0.8%
40	12.2	12.3	0.1	0.4%	1.9	1.9	0.0	0.4%	16.0	16.0	0.1	0.7%
50	12.2	12.3	0.1	0.3%	1.9	1.9	0.0	0.4%	15.9	16.0	0.1	0.7%
60	12.1	12.2	0.1	0.3%	1.9	1.9	0.0	0.4%	15.9	16.0	0.1	0.6%
70	12.1	12.2	0.1	0.3%	1.9	1.9	0.0	0.3%	15.9	15.9	0.1	0.6%
80	12.1	12.2	0.1	0.3%	1.9	1.9	0.0	0.3%	15.8	15.9	0.1	0.6%
90	12.0	12.1	0.1	0.3%	1.9	1.9	0.0	0.3%	15.8	15.9	0.1	0.6%
100	12.0	12.1	0.1	0.3%	1.9	1.9	0.0	0.3%	15.8	15.9	0.1	0.5%
110	12.0	12.1	0.1	0.3%	1.9	1.9	0.0	0.3%	15.8	15.9	0.0	0.5%
Critical Level / Load	**30**				**3**				**10**			

Notes: Exceedances of 1% significance screening criterion are highlighted in **bold**.

Table C3: Fens Pools SAC – modelled maximum values at each 10 m interval

Distance within SAC from road (m)	Maximum Annual Mean NO_x (µg/m^3)				Maximum Annual Mean NH_3 (µg/m^3)				Maximum Nitrogen Deposition Rate (kgN/ha/yr)			
	2042 Alt Base	2042 With Plans	Difference	Difference as % of CL	2042 Alt Base	2042 With Plans	Difference	Difference as % CL	2042 Alt Base	2042 With Plans	Difference	Difference as % of CL
10	25.1	26.3	1.2	**4.1%**	3.1	3.3	0.1	**4.8%**	22.0	22.8	0.8	**8.4%**
20	21.6	22.2	0.6	**2.1%**	2.6	2.6	0.1	**2.4%**	19.3	19.7	0.4	**4.2%**
30	20.0	20.4	0.5	**1.5%**	2.4	2.4	0.1	**1.7%**	18.3	18.6	0.3	**3.1%**
40	19.0	19.4	0.4	**1.2%**	2.3	2.3	0.0	**1.4%**	17.7	17.9	0.3	**2.5%**
50	18.2	18.4	0.3	0.9%	2.2	2.2	0.0	**1.1%**	17.1	17.3	0.2	**1.9%**
60	17.1	17.2	0.2	0.6%	2.1	2.1	0.0	0.7%	16.1	16.2	0.1	**1.1%**
70	17.0	17.1	0.2	0.5%	2.1	2.1	0.0	0.6%	16.0	16.1	0.1	**1.0%**
80	17.0	17.1	0.1	0.5%	2.1	2.1	0.0	0.5%	15.9	16.0	0.1	0.9%
90	17.0	17.0	0.1	0.4%	2.0	2.1	0.0	0.5%	15.8	15.9	0.1	0.9%
100	16.9	17.0	0.1	0.4%	2.0	2.0	0.0	0.5%	15.8	15.9	0.1	0.8%
110	16.9	17.0	0.1	0.4%	2.0	2.0	0.0	0.5%	15.8	15.9	0.1	0.8%
120	16.8	16.9	0.1	0.4%	2.0	2.0	0.0	0.4%	15.8	15.8	0.1	0.7%
130	16.8	16.9	0.1	0.3%	2.0	2.0	0.0	0.4%	15.8	15.8	0.1	0.7%
140	16.8	16.9	0.1	0.3%	2.0	2.0	0.0	0.3%	15.7	15.8	0.1	0.6%
150	16.8	16.8	0.1	0.3%	2.0	2.0	0.0	0.3%	15.7	15.8	0.1	0.6%
160	16.7	16.8	0.1	0.2%	2.0	2.0	0.0	0.3%	15.7	15.7	0.1	0.5%
170	16.7	16.8	0.1	0.2%	2.0	2.0	0.0	0.3%	15.6	15.7	0.1	0.5%
Critical Level / Load	**30**				**3**				**10**			

Notes: Exceedances of 1% significance screening criterion are highlighted in **bold**.

Table C4: Pasturefields Salt Marsh SAC – modelled maximum values at each 10 m interval

Distance within SAC from road (m)	Maximum Annual Mean NO_x (µg/m^3)				Maximum Annual Mean NH_3 (µg/m^3)				Maximum Nitrogen Deposition Rate (kgN/ha/yr)			
	2042 Alt Base	2042 With Plans	Difference	Difference as % of CL	2042 Alt Base	2042 With Plans	Difference	Difference as % CL	2042 Alt Base	2042 With Plans	Difference	Difference as % of CL
0	8.8	8.8	0.0	0.1%	2.5	2.5	0.0	0.1%	17.6	17.6	0.0	0.1%
10	8.7	8.8	0.0	0.1%	2.5	2.5	0.0	0.1%	17.6	17.6	0.0	0.1%
20	8.7	8.8	0.0	0.1%	2.5	2.5	0.0	0.1%	17.6	17.6	0.0	0.1%
30	8.7	8.7	0.0	0.1%	2.5	2.5	0.0	0.1%	17.6	17.6	0.0	0.1%
40	8.6	8.7	0.0	0.1%	2.5	2.5	0.0	0.1%	17.6	17.6	0.0	0.1%
50	8.6	8.6	0.0	0.1%	2.4	2.5	0.0	0.1%	17.5	17.6	0.0	0.1%
60	8.6	8.6	0.0	0.1%	2.4	2.4	0.0	0.1%	17.5	17.5	0.0	0.1%
70	8.5	8.6	0.0	0.1%	2.4	2.4	0.0	0.1%	17.5	17.5	0.0	0.1%
80	8.5	8.6	0.0	0.1%	2.4	2.4	0.0	0.1%	17.5	17.5	0.0	0.1%
90	8.5	8.5	0.0	0.1%	2.4	2.4	0.0	0.1%	17.5	17.5	0.0	0.1%
100	8.5	8.5	0.0	0.1%	2.4	2.4	0.0	0.1%	17.5	17.5	0.0	0.1%
110	8.5	8.5	0.0	0.1%	2.4	2.4	0.0	0.1%	17.5	17.5	0.0	0.1%
120	8.4	8.5	0.0	0.1%	2.4	2.4	0.0	0.1%	17.4	17.5	0.0	0.1%
130	8.4	8.4	0.0	0.1%	2.4	2.4	0.0	0.1%	17.4	17.4	0.0	0.0%
140	8.4	8.4	0.0	0.0%	2.4	2.4	0.0	0.1%	17.4	17.4	0.0	0.0%
150	8.4	8.4	0.0	0.0%	2.4	2.4	0.0	0.0%	17.4	17.4	0.0	0.0%
160	8.4	8.4	0.0	0.0%	2.4	2.4	0.0	0.0%	17.4	17.4	0.0	0.0%
170	8.3	8.3	0.0	0.0%	2.4	2.4	0.0	0.0%	17.4	17.4	0.0	0.0%
180	8.2	8.3	0.0	0.0%	2.4	2.4	0.0	0.0%	17.4	17.4	0.0	0.0%
190	8.2	8.2	0.0	0.0%	2.4	2.4	0.0	0.0%	17.4	17.4	0.0	0.0%
200	8.2	8.2	0.0	0.0%	2.4	2.4	0.0	0.0%	17.4	17.4	0.0	0.0%
Critical Level / Load		**30**				**1**				**10**		

Appendix D Middlemarch Project Brief (March 2023)

Creation of an Air Pollution Evidence Base Brief to Support Local Plan HRA

Staffordshire, Wolverhampton, Walsall, Sandwell and Dudley

A Report to: South Staffordshire District Council
c/o the Combined Partnership Authorities
Report Number: RT-MME-159172-01, Rev B
Date: March 2023

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Quality Assurance

Date	Version	Author	Checked by	Approved by
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11/01/2023	FINAL, Rev A	Chris Walsh BSc (Hon), MSc (Hon) (Principal Consultant)	Louise Fox BSc (Hon), GDP Law, MSc (Hon) (Principal Consultant)	Dr Amanda Flint (Biodiversity Manager)
10/03/2023	FINAL, Rev B	Chris Walsh BSc (Hon), MSc (Hon) (Principal Consultant)	Louise Fox BSc (Hon), GDP Law, MSc (Hon) (Principal Consultant)	

Declaration of Compliance

This study has been undertaken in accordance with British Standard 42020:2013 "Biodiversity, Code of Practice for Planning and Development". The information which we have prepared is true, and has been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management's Code of Professional Conduct. We confirm that the opinions expressed are our true and professional bona fide **opinions.**

Disclaimer

The contents of this report are the responsibility of Middlemarch Environmental Ltd. It should be noted that, whilst every effort is made to meet the client's brief, no site investigation can ensure complete assessment or prediction of the natural environment. Middlemarch Environmental Ltd accepts no responsibility or liability for any use that is made of this document other than by the client for the purposes for which it was originally commissioned **and prepared.**

Validity of Data

The findings of this study are valid for a period of 24 months from the date of survey. If works have not commenced by this date, an updated site visit should be carried out by a suitably qualified ecologist to assess any changes in the habitats present on site, and to inform a review of the conclusions and recommendations made.

Non-Technical Summary

Project Background

In October 2022, Middlemarch Environmental were instructed by South Staffordshire District Council (SSDC) to prepare a brief; a detailed step by step methodology of how SSDC and one or more partnership Local Planning Authorities (hereafter referred to collectively as the 'partnership authorities') could establish a scientific and robust evidence base to determine the likely air pollution impacts (via increased traffic generation) on several European sites should emerging Local Plan/s be adopted.

Footprint Ecology's October 2022 Habitats Regulations Assessment (HRA) of the South Staffordshire Local Plan Review 2018-2038 (Publication Plan, Regulation 19) concluded that without additional evidence, and in line with the precautionary principle, the reasonable possibility of the proposed allocations resulting in traffic growth sufficient to have a significant impact upon several European sites via increased deposition of nitrogen (NO_x and NH_3) could not be screened out.

This work is, in the first instance, to support the undertaking of the Local Plan Habitats Regulations Assessment/s for SSDC, for which Footprint Ecology Ltd has already been engaged.

However, the evidence base that is to be established is planned to be sufficient (in its geographic scope and scale of considered in-combination traffic growth) to allow it to be used as an evidence base to support the HRAs of the other partnership authorities over several years, as proposed allocations within Local Plan/s move forward.

This brief does not consider traffic generation created as a result of agricultural development or their subsequent operations.

This brief clarifies in detail the European sites, road locations, methodology and thresholds by which further screening will be undertaken.

It is important to note that if the screening threshold for a European site is exceeded, this does not result in the conclusion that increased air pollution will have a significant impact upon the qualifying features of the European site, the habitats or ecological functions upon which the qualifying feature rely or else prevent or otherwise impede the delivery of the site/s conservation objectives. Rather, it displays that there is a likelihood of such an impact occurring and that an Appropriate Assessment must be undertaken to conclude if the level of atmospheric deposition of nitrogen (and the locations within the statutory boundaries where it is deposited) is likely to result in a significant impact upon the integrity of the European site.

For any European site where possible impacts cannot be screened out, this brief also outlines an approach by which an Appropriate Assessment can be undertaken to determine if the available nitrogen deposition volume and location is likely to result in a significant impact upon the integrity of the European site/s.

Natural England's consideration and input into this brief was sought and written comments were provided on the 8th of February 2023. Subsequently a meeting was held between Natural England and representatives of the partnership authorities on the 14th of February 2023 where further recommendations were provided. All recommendations and further considerations raised by Natural England have been incorporated into this revised Evidence Base Brief (Rev B).

The relevant European sites to be assessed are depicted in Drawing C159172-03 (see Map Annex RT-MME-159172-02). They comprise of all Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Ramsar Wetlands of International Importance land parcels where:

- The qualifying habitats or criterion for selection of the European site are known to be impacted by increased deposition of nitrogen;
- Increased deposition of nitrogen is known to impact on habitats on which the qualifying species or criterion for selection of the European site rely;
- The site is within the SSDC local plan area or the local plan area of another partner authority; or,
- The site is within 10km of the boundaries of these areas or has been identified by Natural England as requiring consideration.

The European sites considered within this brief are:

- Cannock Chase SAC;
- Pasturefields Salt Marsh SAC;
- West Midlands Mosses SAC;
- Midlands Meres and Mosses Phase 1 Ramsar Site;
- Midlands Meres and Mosses Phase 2 Ramsar Site;
- Mottey Meadows SAC;
- Cannock Extension Canal SAC;
- Fens Pools SAC,
- Peak District Dales SAC, and
- Bees Nest and Green Clay Pits SAC

Contents

1. Identification of Assessment Locations

1.1. Introduction

1.1.1. The Department of Transport's Transport Analysis Guidance[1] states *"Beyond 200m the contribution of vehicle emissions from roadside to local pollution levels is not significant"*.

1.1.2. Additionally, section 5.3.7 of the Institute of Air Quality Management (IAQM) 2020 guidance on the assessment of air quality impacts on designated nature conservation sites[2] concludes *"For strategic planning, where substantial changes in traffic volumes are being considered, there is the potential for wider-scale impacts, which can potentially affect the future background concentrations, as well as concentrations within 200m of individual roads within the affected network."*

1.1.3. The 200m atmospheric deposition distance for vehicular emissions is also recognised by Natural England in their 2018 guidance (Approach to advising competent authorities on the assessment of road traffic emission under the Habitats Regulations", (NEA001-2018))[3]. The guidance advises that the first step is to identify the spatial distribution of qualifying features within a designated site and that if there are no qualifying features sensitive to air pollution within 200m of a road, then no further assessment is required.

1.1.4. Natural England's 2018 guidance determines that a Competent Authority should consider the implications of a plan or project against three 'nitrogen thresholds' when undertaking HRA screening.

1.1.5. These thresholds are:

- An increase (on any single road) in Annual Average Daily Traffic (AADT) of 1000 domestic vehicles or greater;
- An increase (on any single road) in AADT of 200 HGV or greater; or
- That the predicted pollution concentration of nutrient deposition for the oxides of nitrogen (NO_x), ammonia (NH_3) or nitrogen (N), due to vehicular emissions and/or direct emissions from the development is:
  - Equal to or greater than 1% of the pollutants Critical Level ($\mu g/m^{3-s}$), or
  - Equal to or greater than 1% of the site's Nitrogen Critical load ($Kg/N/ha^1/year^1$).

1.1.6. It should be noted that even if a plan exceeds either, or both AADT thresholds it may still be screened out if the level of modelled emissions and nitrogen deposition are shown to be less than 1% of the Nitrogen Critical Load of the European site under consideration.

1.1.7. Additionally, the impacts of increased air pollution on European sites due to traffic growth will also be determined in line with the Institute of Air Quality Management 2020

[1] Gov.uk, Transport analysis guidance, (2021), Available at: https://www.gov.uk/guidance/transport-analysis-guidance-tag
[2] Institute of Air Quality Management, (2020), A guide to the assessment of air quality impacts on designated nature conservation sites, V1.1, Available at: https://iaqm.co.uk/text/guidance/air-quality-impacts-on-nature-sites-2020.pdf
[3] Natural England (2018), approach to advising competent authorities on the assessment of road traffic emission under the Habitats Regulations, NEA001-2018 , Available at: http://publications.naturalengland.org.uk/publication/4720542048845824

methodology[4] and using relevant critical load levels derived from the UK Air Pollution Information System (APIS) website.

1.2. Identification of Roads where Significant Traffic Growth May Occur

1.2.1. Drawing C159172-01 (see Map Annex RT-MME-159172-02) illustrates all roads within 200m of the boundary of all parcels of the ten European sites in consideration.

1.2.2. Consistent with the categories used by Footprint Ecology[5] the roads have been split into four different categories:

- *Motorways;*
- *A Roads;*
- *B Roads; or*
- *Unclassified/Minor Roads.*

1.2.3. For the majority of '*unclassified and minor roads',* due to their reduced traffic capacity and lack of connectivity between settlements and to areas of employment or services (i.e., medical, schools, provisioning, etc.) it can be considered highly unlikely the partner authorities land use allocations (either alone or in combination with partners plans) could result in a significant AADT increase (see Section 1.1.5).

1.2.4. As such (with some key exceptions) it is recommended that the majority of '*unclassified and minor roads'* can be screened out from the need for assessment of traffic growth.

1.2.5. Table 1.1. identifies what is considered to represent the key roads within 200m of the land parcels of European sites in consideration. For each key road a Recommended Assessment Point (RAP) has been determined.

[4] Institute of Air Quality Management, (2020), A guide to the assessment of air quality impacts on designated nature conservation sites, V1.1, Available at: https://iaqm.co.uk/text/guidance/air-quality-impacts-on-nature-sites-2020.pdf
[5] Footprint Ecology, (2022), HRA of the South Staffordshire Local Plan Review 2018-2038 (publication Plan, Regulation 19), Available at: https://www.sstaffs.gov.uk/planning/local-plan-review-3.cfm

European Site Name	Land Parcel (If Applicable)	Road Type	Road Name	Location/s (Grid Ref)	RAP Ref Number
Cannock Chase SAC	N/A	A	A513	SJ 97863 20801	RAP 1
		A	A460 (Rugeley Rd)	SK 02167 14729	RAP 2
		Unclassified/Minor	Camp Rd	SJ 97715 17067	RAP 3
Pasturefields Salt Marsh SAC	N/A	A	A51	SJ 99458 24888	RAP 4
West Midlands Mosses SAC and Midlands Meres and Mosses Ramsar Phase 1 Site	Chartley Moss	A	A518	SK 02143 28927	RAP 5
	Wybunbury Moss	B	B5071	SJ 69555 49964	RAP 22
Midlands Meres and Mosses Phase 2 Ramsar Site	Aqualate Mere	Unclassified/Minor	Walkley Bank	SJ 75639 20961	RAP 6
		Unclassified/Minor	Guild Lane	SJ 78883 20220	RAP 7
	Cop Mere	Unclassified/Minor	Un-named Rd to East of Cop Mere	SJ 80303 29457	RAP 8
	Black Firs & Cranberry Bog	A	A531 (Newcastle Rd)	SJ 74654 50071	RAP 23
		Unclassified/Minor	Post Office Lane	SJ 74778 50478	RAP 24
	Oakhanger Moss	Motorway	M6	SJ 77091 55066	RAP 25
Mottey Meadows SAC	N/A	Unclassified/Minor	Marston Rd	SJ 84388 13684	RAP 9
Cannock Extension Canal SAC	N/A	A	A5 (Watling St)	SK 02021 06915	RAP 10
		B	B4154 (Lime Ln)	SK 02005 06290	RAP 11
Fens Pools SAC	N/A	A	A4101 (High Street)	SO 92068 89240	RAP 12
		A	A461 (Stourbridge Rd)	SO 92407 88622	RAP 13
Midlands Meres and Mosses Ramsar Phase 1 Site	Betley Mere	Unclassified/Minor	Cracow Moss	SJ 75260 47444	RAP 14

Table 1.1: Roads to be Assessed (Continues)

European Site Name	Land Parcel (if applicable)	Road Type	Road Name	Location/s (Grid Ref)	RAP Ref Number
Peak District Dales SAC	N/A	Unclassified/Minor	The Pinch	SK 1461 5507	RAP 15
		Unclassified/Minor	Liffs Rd	SK 1579 5673	RAP 16
		Unclassified/Minor	Larkstone Lane	SK 1003 5411	RAP 17
		Unclassified/Minor	-	SK 1225 5156	RAP 18
		Unclassified/Minor	-	SK 1336 5042	RAP 19
		Unclassified/Minor	Leek Rd	SK 0984 5567	RAP 20
		Unclassified/Minor	Parwick Lane	SK 1942 5620	RAP 21
Bees Nest & Green Clay Pits SAC	N/A	Unclassified/Minor	Manystones Lane	SK 24035 54943	RAP 26

Table 1.1: (Continued) Roads to be Assessed

1.2.6. In total it is considered that a robust screening assessment could be undertaken by determining the likely impact at 26 RAPs across the total area of consideration. The location of each RAP is depicted on Drawing C159172-02 (Map Annex RT-MME-159172-02).

1.2.7. However, it is considered that there is rationale to reduce the total RAPs down to ten locations without a material reduction in the robustness of the evidence base.

1.2.8. At the evidence base's inception stage, it appears highly unlikely that the adoption of land usage allocations within any of the partnership authorities' local plans (either alone or in combination) could result in a significant impact (as a result of increased nitrogen deposition derived from traffic growth) upon:

- Chartley Moss;
- Aqualate Mere;
- Mottey Meadows;
- Betely Mere;
- Wynbunbury Moss;
- Black Firs & Cranberry Bog
- Bees Nest & Green Clay Pits SAC or
- Any land parcel of the Peak District Dales SAC.

1.2.9. The rationale for Screening out these areas from the need for further assessment are provided in sections 1.3 to 1.10.

1.2.10. Whilst it is recommended that these land parcels could be removed from the need for further assessment (without degrading the robustness of the evidence base produced) it is important that discussions with the Appropriate Authority (Natural England) are undertaken on this matter, and due regard given to their considerations before determining the final approach.

1.3. Chartley Moss, Rationale for Scoping Out

1.3.1. Within 200m of Chartley Moss (which constitutes a land parcel of both West Midlands Mosses SAC and Midlands Meres and Mosses Ramsar Phase 1 Site) it is considered that adoption of land use allocations by the partnership authorities local plans could only result in significant traffic growth on the A518 (RAP 5).

1.3.2. This is due to all other roads within 200m either only:

- Providing access to private residences, or
- Being a single tracked road, which does not act as a link between settlements or a route to the provision of services.

1.3.3. It is considered highly unrealistic that the adoption of land use allocations (from one or more partnership local plans) could result in an increase in AADT of 1000 or greater domestic vehicles or 200 or greater HGVs along a single-track road, which does not provide a clear link between two settlements or provide a route linking areas or residential growth to employment or services.

1.3.4. As such the A518 is the only key road identified in Table 1.1.

1.3.5. Section 4.19 of Natural England's 2018 guidance (see Section 1.1.3) states:

- *"An early understanding of the spatial distribution of features within a site can help to decide whether or not appropriate assessment will be required*… [if] *any sensitive qualifying features are not present within the area to be affected by emissions (and Natural England's advice is that there is no conservation objective to restore the features to that area), it will be relatively straightforward to ascertain that the plan or project poses no credible air quality risk to it*."

1.3.6. The only habitat within the SAC and Ramsar site which lies within 200m of the A518 is an area of broad-leaved deciduous woodland within Parcel 5 of the underlying Chartley Moss SSSI[6]. Broad-leaved deciduous woodland is not a qualifying feature of the SAC designation, a criterion for its selection as a Ramsar site or a habitat upon which the species (which form its criterion for Ramsar selection) rely.

[6] Natural England, Chartley Moss SSSI, Parcel 5 'RAILWAY – BUFFER', Site information, Available at: https://designatedsites.naturalengland.org.uk/UnitDetail.aspx?UnitId=1022792

1.3.7. In line with Natural England's 2018 guidance, no further assessment should be required on the Chartley Moss land parcel of the West Midlands Mosses SAC and the Midlands Meres and Mosses Ramsar Phase 1 Site.

1.4. Aqualate Mere, Rational for Scoping Out

1.4.1. No 'A' or 'B' roads lie within 200m of the boundary of Aqualate Mere.

1.4.2. Only two minor roads (Walkley Bank and Guild Lane) lie within 200m of the site boundary.

1.4.3. Both roads are single track along their entire length.

1.4.4. Walkley Bank (RAP 6) links the hamlets of Meretown and Forton.

1.4.5. Guild Lane (RAP 7) does not provide a clear link between any settlements or provide a route linking areas or residential growth to employment or services, rather it functions primarily to provide access to a small capacity car park by which members of the public can access Aqualate Mere.

1.4.6. Due to their inherent low traffic capacity and their lack of obvious connectivity between notable settlements, places of employment or services, it is considered highly unrealistic to consider that the adoption of land use allocations (from one or more local plans) would result in an increase in AADT of 1000 (or greater) domestic vehicles or 200 (or greater) HGVs on either of the minor roads within 200m of the boundary of Aqualate Mere.

1.4.7. Section 4.17 of the Natural England's 2018 Guidelines (see Section 1.1.3) states:

- *"Usually, only those European sites present within 200m of the edge of a road on which a plan or project will generate traffic will need to be considered when checking for the likelihood of significant effects from road traffic emissions."*

1.4.8. Based on the information available it appears highly unlikely that the future adoption of partnership local authorities' local plans (alone or in combination) could result in a measurable increase in annual traffic generation on either Walkley Bank or Guild Lane.

1.4.9. In line with Natural England's 2018 guidelines[7] no further assessment should be required on the Aqualate Mere land parcel of the Midlands Meres and Mosses Phase 2 Ramsar Site.

[7] [7] Natural England (2018), approach to advising competent authorities on the assessment of road traffic emission under the Habitats Regulations, NEA001-2018 , Available at: http://publications.naturalengland.org.uk/publication/4720542048845824

1.5. Mottey Meadows, Rational for Scoping Out

1.5.1. No 'A' or 'B' roads lie within 200m of the boundary of Mottey Meadows SAC.

1.5.2. Only two minor roads (Marston Road and Gay Lane) lie within 200m of the site boundary.

1.5.3. Both roads are single track along their entire length.

1.5.4. Gay Lane only provides access to a single private residence.

1.5.5. Marston Road (RAP 9) links the village of Wheaton Aston to the hamlet of Marston.

1.5.6. Due to their inherent low traffic capacity and their lack of obvious connectivity between notable settlements and places of employment or services, it is highly unrealistic to consider that the adoption of land use allocations (from one or more of the partnership authorities' local plans) would result in an increase in AADT of 1000 (or greater) domestic vehicles or 200 (or greater) HGVs on either of the minor roads within 200m of the boundary of Mottey Meadows.

1.5.7. Based on the information available it appears highly unlikely that the future adoption of partnership local authorities' local plans (alone or in combination) could result in a measurable increase in annual traffic generation on either Gay Lane or Marston Road.

1.5.8. In line with Natural England's 2018[8] guidelines no further assessment should be required on Mottey Meadows SAC.

1.6. Betley Mere, Rational for Scoping Out

1.6.1. Betley Mere (a land parcel of the Midlands Meres and Mosses Ramsar Phase 1 Site) does not lie within a partnership authorities' boundary but does lie within 10km of a jurisdictive boundary.

1.6.2. No 'A' or 'B' roads lie within 200m of the Betley Mere land parcel of the Midlands Meres and Mosses Ramsar Phase 1 Site.

1.6.3. Only one minor road (Cracow Moss) lies within 200m of the site boundary.

1.6.4. Cracow Moss (RAP 14) only provides access to a small number of scattered private residences.

1.6.5. The road is single track along its entire length.

[8] Natural England (2018), approach to advising competent authorities on the assessment of road traffic emission under the Habitats Regulations, NEA001-2018 , Available at: http://publications.naturalengland.org.uk/publication/4720542048845824

1.6.6. Due to its inherent low traffic capacity and lack of any connectivity between notable settlements and places of employment or services, it is highly unrealistic to consider that the adoption of land use allocations (from one or more of the partnership authorities' local plans) would result in any increase in AADT on Cracow Moss.

1.6.7. In line with Natural England's 2018 guidelines[9] no further assessment should be required on the Betley Mere land parcel of the Midlands Meres and Mosses Ramsar Phase 1 Site.

1.7. Wynbunbury Moss, Rational for Scoping Out

1.7.1. No part of the Wynbunbury Moss (a land parcel of the Midlands Meres and Mosses Phase 1 Ramsar Site) lies within a partnership authorities' boundary, or within 10km of any jurisdictive boundary.

1.7.2. No 'A' roads lie within 200m of the boundary of Wynbunbury Moss and only one B road, Stock Lane is present (the B5071). Where Stock Lane is present within 200m of the site it is either at the very limit of the 200m deposition distance buffer or it is separated from the Ramsar site by intervening residential development (the village of Wybunbury). It is considered that the residential developments would likely act as anthropogenic physical barriers, notably reducing the dispersal distance of any air pollution, nitrogen deposition and acidification.

1.7.3. Stock Lane (RAP 22) links the village of Wynbunbury to the village of Shavington.

1.7.4. Based on the information available it appears highly unlikely that the future adoption of partnership local authorities' local plans (alone or in combination) could result in a measurable increase in annual traffic generation between the villages of Wynbunbury to the village of Shavington.

1.7.5. In line with Natural England's 2018 guidelines[10] no further assessment should be required on the Wynbunbury Moss land parcel of the Midlands Meres and Mosses Phase 1 Ramsar Site.

1.8. Black Firs & Cranberry Bog, Rational for Scoping Out

1.8.1. No part of the Black Firs and Cranberry Bog (a land parcel of the Midlands Meres and Mosses Phase 2 Ramsar Site) lies within a partnership authorities' boundary, or within 10km of any jurisdictive boundary.

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[9] Natural England (2018), approach to advising competent authorities on the assessment of road traffic emission under the Habitats Regulations, NEA001-2018 , Available at: http://publications.naturalengland.org.uk/publication/4720542048845824

[10] [10] Natural England (2018), approach to advising competent authorities on the assessment of road traffic emission under the Habitats Regulations, NEA001-2018 , Available at: http://publications.naturalengland.org.uk/publication/4720542048845824

1.8.2. Only one A road, Newcastle Rd (the A531) and one B road (B5500) lies within 200m of the boundary of the site.

1.8.3. Newcastle Rd (RAP 23) links several small villages and hamlets, Madeley Heath, Bowsey Wood, Wrinehil, Betley, New Thorntree, Hough, Shavington and Blakelow. It is considered highly unlikely that the future adoption of partnership local authorities' local plans (alone or in combination) could result in a measurable increase in annual traffic generation between these villages.

1.8.4. The B5500 runs north of the site and only likes the hamlet of New Thorntree to the hamlet of Balterley.

1.8.5. Only two minor roads are within 200m of the boundary of the site, Waybutt Lane and Post Office Lane.

1.8.6. Waybutt Lane provides access (off of the A531) to a single farm and the village of Chorlton.

1.8.7. Post Office Lane (RAP 24) provides an alternative access from the hamlet of New Thorntree to the B5500 and is single track along the majority of its length.

1.8.8. Based on the information available it appears highly unlikely that the future adoption of partnership local authorities' local plans (alone or in combination) could result in a measurable increase in annual traffic generation between the hamlets of New Thorntree and Balterley or result in additional trips to/from the village Chorlton.

1.8.9. In line with Natural England's 2018 guidelines[11] no further assessment should be required on the Black Firs and Cranberry Bog land parcel of the Midlands Meres and Mosses Phase 2 Ramsar Site.

1.9. Bees Nest & Green Clay Pits SAC, Rational for Scoping Out

1.9.1. No part of the Bees Nest and Green Clay Pits SAC lies within a partnership authorities' boundary, but it does lie within 10km of a jurisdictive boundary.

1.9.2. No 'A' or 'B' roads lie within 200m of the SAC boundary.

1.9.3. Only two minor roads, Manystones Lane (RAP 26) and Wirksworth Dale lie within 200m of the SAC boundary.

1.9.4. Both roads are single track along their entire length. Wirksworth Dale provides access to several fields. Manystone Lane links the villages of Bassington and Bolehill.

1.9.5. Based on the information available it appears highly unlikely that the future adoption of partnership local authorities' local plans (alone or in combination) could result in a

[11] [11] Natural England (2018), approach to advising competent authorities on the assessment of road traffic emission under the Habitats Regulations, NEA001-2018 , Available at: http://publications.naturalengland.org.uk/publication/4720542048845824

measurable increase in annual traffic generation to the fields along Wirkworth Dale or between the villages of Bassington and Bolehill.

1.9.6. In line with Natural England's 2018 guidelines no further assessment should be required on the Bees Nest and Green Clay Pits SAC.

1.10. Peak District Dales SAC, Rational for Scoping Out

1.10.1. No part of the Peak District Dales SAC lies within a partnership authorities' boundary, but several land parcels are within 10km of a jurisdictive boundary.

1.10.2. In total 17 land parcels (of varying sizes) lie within 10km of the jurisdictive boundary of a partnership authority.

1.10.3. No 'A' or 'B' roads lie within 200m of any of the land parcels of the Peak District Dales SAC which are partly, or wholly, within 10km of a jurisdictive boundary of a partnership authority.

1.10.4. Whilst a large number of roads lie within 200m of the 17 land parcels, the vast majority only provide access to isolated private residences and farms or are farm tracks providing access to fields and so are not public highways.

1.10.5. It is considered that seven key roads lie within 200m of the land parcels considered (The Pinch, Liffs Road, Larkstone Lane, Leek Road, Parwick Lane and two unnamed roads). All are minor roads.

1.10.6. All seven roads are single track along their entire length.

1.10.7. None of the roads appear to function as a link between any notable settlements, to connect a settlement/s with places of employment (with the exception of agricultural access) or services.

1.10.8. Due to their inherent low traffic capacity and their lack of obvious connectivity between notable settlements and places of employment or services, it is highly unrealistic to consider that the adoption of land use allocations (from one of more of the partnership authorities' local plans) would result in an increase in AADT of 1000 (or greater) domestic vehicles or 200 (or greater) HGVs on any of the identified seven key roads within 200m of any of the land parcels of the Peak District Dales SAC.

1.10.9. Based on the information available, it appears highly unlikely that the future adoption of partnership local authorities' local plans (alone or in combination) could result in a measurable increase in annual traffic generation on any of the key roads.

1.10.10. In line with Natural England's 2018[12] guidelines no further assessment should be required on the Peak District Dales.

[12] Natural England (2018), approach to advising competent authorities on the assessment of road traffic emission under the Habitats Regulations, NEA001-2018 , Available at: http://publications.naturalengland.org.uk/publication/4720542048845824

1.11. Recommended Assessment Locations

1.11.1. Based upon the rational provided above (see Sections 1.3 - 1.10), and assuming that consultation with Natural England is completed (and they provide written conformation confirming that they concur that the reasons for removing several European sites from further consideration to be robust), the revised list of RAP's is detailed below in Table 1.2.

European Site Name	Land Parcel (If Applicable)	Road Type	Road Name	Location/s (Grid Ref)	RAP Ref Number
Cannock Chase SAC	N/A	A	A513	SJ 97863 20801	RAP 1
		A	A460 (Rugeley Rd)	SK 02167 14729	RAP 2
		Unclassified/Minor	Camp Rd	SJ 97715 17067	RAP 3
Pasturefields Salt Marsh SAC	N/A	A	A51	SJ 99458 24888	RAP 4
Midlands Meres and Mosses Phase 2 Ramsar Site	Cop Mere	Unclassified/Minor	Un-named Rd to East of Cop Mere	SJ 80303 29457	RAP 8
	Oakhanger Moss	Motorway	M6	SJ 77091 55066	RAP 25
Cannock Extension Canal SAC	N/A	A	A5 (Watling St)	SK 02021 06915	RAP 10
		B	B4154 (Lime Ln)	SK 02005 06290	RAP 11
Fens Pools SAC	N/A	A	A4101 (High Street)	SO 92068 89240	RAP 12
		A	A461 (Stourbridge Rd)	SO 92407 88622	RAP 13

Table 1.2.: Roads to be Assessed after Scoping

2. Screening Thresholds

2.1. Screening Against Modelled AADT Growth

2.1.1. A suitably experienced Traffic and Transport Consultancy (TTC) should be engaged and provided with appropriately attributed shape files of all the land use allocations of the partnership authorities where preferred options are known[13].

2.1.2. At all RAPs the TTC must model the likely traffic growth of all known site allocations over the total extent of the (combined) local plan periods. This information can be derived via Trip Rate Information Computer System datasets (TRICS[14])[15].

2.1.3. TRICS is a national system of trip generation analysis based on an extensive database formed from several thousand transport surveys. This allows TRICS datasets to determine inbound and outbound traffic generation and trip dispersal for a wide variety of development types across all geographic regions of the UK.

2.1.4. The vehicular and HGV trip generation rates for all the site allocations provided to the TCC (and the likely destinations of these new trips) can be combined to determine likely net-AADT growth at each assessment location.

2.1.5. Site allocation's that will result in the re-development of a previously developed site (especially those that result in a reallocation from employment to residential) frequently have the outcome of changing traffic types and traffic patterns. These types of site allocation often result in changes in the types and patterns of vehicle trip cause by the site and will reduce in AADT on some roads whilst increasing it on others.

2.1.6. As such, where a site allocation is for the re-development of a currently developed and still operational, only its net-increase in AADT at any RAP should be considered.

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[13] **Please note: It is understood that, at this time, many partnership authorities have not yet identified the preferred locations of future Local Plan allocations. This will not prevent the assessment being undertaken as the likely in-combination traffic growth / nitrogen deposition can be accounted for using national data sets to derive regional traffic growth factors which can then be used to reflect traffic growth from both 'unallocated partnership a thorites' and traffic growth originating from outside the combined partner authority's area (see Section 2.2). Subsequently, when a partnership authority (which currently lacks preferred allocation location data) wishes to assess the possible impacts of their own AADT growth, the traffic growth at all RAPs will need to be re-modelled (in accordance with the methodology detailed in Section 2.1), but only using the shape files of their allocations. Once AADT growth figures for that partnership authorities are determined (in isolation) they can then be compared against the previously modelled in-combination values at each RAP. Should their AADT growth be determined to be less than the previously modelled in-combination values then it can be assumed that their impacts have already been accounted for and their likely impacts fully assessed. Their AADT growth would then be deducted from the previously modelled in-combination values, reducing the 'pool' of in-combination AADT for future partnership authorities to test against. In this manner it is anticipated that the pool of in-combination AADT at each RAP will reduce over time as successive additional sets of Local Plan allocations are tested against it.**

[14] TRICS, 2022, Available at: https://www.trics.org/Default.aspx

[15] Based upon the TTC's advice, alternative traffic models to TRICS may be recommended to generate site specific trip data. These other models could be used if deemed more robust, but re-consultation with NE should occur prior to the adoption of an alternative model.

2.1.7. The net-AADT of site allocations on previously developed and still operational sites can be calculated by the TTC by:

- Determining the currently operational site's trip generation / AADT along the highway network, and
- Deducting the sites current trip generation / AADT figures from the modelled trip generation / AADT figures, attributed to its new allocation.

2.1.8. At any RAP where the likely **net-AADT of all known land usage allocations** is determined to be **0,** no further assessment is required at that location.

2.1.9. At any RAP where the likely **net-AADT of all known land usage allocations** is determined to be **between 1-999 domestic vehicles** or **1-199 HGV's,** an **in-combination assessment is required,** and the possible traffic growth caused by other plans and projects must be considered (see Section 1.6).

2.1.10. At any RAP where the likely **net-AADT of all known land usage allocations** is determined to be **1000 or greater domestic vehicles** or **200 or greater HGV's,** there is a **possible significant impact upon a European site in isolation.** In this instance then further screening against site specific critical load thresholds using nitrogen deposition modelling must occur (see Section 1.7).

2.2. Traffic Growth In-combination Assessment

2.2.1. The requirement for in-combination assessment is enshrined within the HRA process and must be undertaken on every potential impact which is shown to be insignificant in isolation.

2.2.2. By amalgamating the spatial data of all available preferred land usage allocations from multiple partnership authorities, their combined traffic growth at each RAP has already been calculated (via TRICS derived modelling) and considered against each other. However, this figure is unlikely to represent all the future traffic growth of these roads as:

- It is unable to account for traffic growth from those partnership authorities where the locations of preferred land usage allocation have yet to be determined; and
- It is unable to account for traffic growth originating from plans or projects that occur outside of the partner authority's area.

2.2.3. To account for both currently 'unallocated partnership authorities' and 'out of partnership area' growth it is considered that an appropriate value to represent likely in-combination growth could be determined by the TCC via usage of the Trip End Model Presentation Program (TEMPro[16]). TEMPro is used to view the National Trip End Model (NTEM[17])[18] which allows for the forecasting of regional traffic growth up to the end of the combined

[16] Trip End Model Presentation Program (TEMPro), available at: https://www.gov.uk/government/publications/tempro-downloads
[17] The Department for Transport (2022) National Trip End Model (NTEM), OGL, Available at: https://www.data.gov.uk/dataset/11bc7aaf-ddf6-4133-a91d-84e6f20a663e/national-trip-end-model-ntem
[18] Based upon the TTC's advice, alternative traffic models to NTEM may be recommended to generate in-combination AADT. These other models could be used if deemed more robust, but re-consultation with NE should occur prior to the adoption of an alternative model.

local plan periods. Once this growth factor is determined it can be applied to the existing base rate of AADT for the roads being assessed and the 'in-combination AADT' can be calculated.

- *For example: if the baseline AADT was 3000 and the growth factor was 2%, the likely 'in-combination AADT' would be 3060.*

2.2.4. On any road where the total value of the **known land usage allocations** generated **net-AADT** (calculated using TRICS dataset) and the forecast for the regional traffic growth (derived using TEMPro) is **less than 1000 AADT for domestic vehicles** or less than **200 AADT for HGV** then it has been clearly demonstrated that the **adoption of the known allocations, in combination with other plans, are highly unlikely to result in a significant impact** to that European site (due to increased traffic emissions).

2.2.5. On any road where the total value of **the known land usage allocations generated net-AADT** and the forecast for the regional traffic growth is **1000 AADT or greater for domestic vehicles**, or **200 AADT or greater for HGVs**, then there is a **possible significant impact upon a European site in combination with other plans.** In this instance, further screening against site specific critical load thresholds using nitrogen deposition modelling must occur (see Section 1.7).

2.2.6. It is noted that to allow for in-combination traffic growth to be calculated via TEMPro, the current baseline traffic rate for the roads at each RAP will need to be determined (where it has been concluded that net-AADT of all known allocations is less than 0). Whilst recent baseline traffic rate data may already be available for 'A' and 'B' roads, it is considered unlikely that this information will be available for the majority (or possibly all) of the unclassified / minor roads. As such, the existing traffic level at several RAPs may need to be determined via a new traffic counting survey.

2.2.7. The undertaking of traffic counting surveys is restricted to certain times of the year (i.e., periods deemed to represent 'usual traffic').

2.2.8. Where and when additional traffic counting surveys will need to be undertaken will need to be discussed with the TCC upon their appointment to ensure that robust and current traffic figures are available at all RAP locations where an in-combination assessment needs to be undertaken.

2.3. Screening Against Modelled Air Pollution, Nitrogen Deposition and Acidification.

2.3.1. A suitably experienced Air Quality Consultant (AQC) should be engaged and provided with the traffic growth data for all RAP locations where the net-AADT (alone or in-combination exceeds either of the traffic screening thresholds (see Section 1.1.5.).

2.3.2. The AQC will be instructed to model[19] the levels of gaseous ammonia (NH_3) and the oxides of Nitrogen (collectively NO_x) generated by the likely traffic growth along a 200m transect (running from the RAP location towards the nearest location in the Europeans site where the qualifying habitat is present (or habitats upon which the qualifying species relies).

2.3.3. The AQC will also determine the levels of deposition of nitrogen and acidification that could occur from the modelled levels of pollutants along the same 200m transect.

2.3.4. The AQC should take account or relevant meteorological data for each RAP where a transect is to be modelled.

2.3.5. **Critical Levels for NO_x and NH_3**

- In extreme cases NO_x can be directly toxic to vegetation and so impact directly on the qualifying habitats of European sites, but its main importance is as a source of nitrogen, which is then deposited. The 'critical level' is the atmospheric concentration at which NO_x could begin to directly impact upon vegetation. **For NO_x the critical level**, as detailed on the UK Air Pollution Information System (APIS)[20], **is 30 µg/m^{3-s}**. As such, **if the change in concentration is predicted to be greater than 0.3 µg/m^{3-s}, then 1% of the critical level has been exceeded**.

- NH_3 differs from NO_x in that it is both a source of nitrogen and is also directly toxic to vegetation in relatively low concentrations. **For NH_3 the critical level**, as detailed on the UK Air Pollution Information System (APIS)[21], **is either 1 µg/m^{3-s} for lower plants or 3 µg/m^{3-s} for higher plants**. To determine which critical level should be accessed against consideration must be given as to which order/s of plant constitute a key ecological component of the qualifying habitat, or habitat on which qualifying species rely. If lower plants (bryophytes, stoneworts, liverworts etc.) are considered to constitute a key ecological component then the lower value should be used. As such, **if the change in concentration is predicted to be greater than either 0.01 µg/m^{3-s} or 0.03 µg/m^{3-s} (whichever is determined to be most appropriate), then 1% of the critical level has been exceeded.**

- The change in pollutant concentrations due to the modelled traffic growth is known as the Process Contribution (PC).

[19] Via usage of ADMS-Roads, the Emission Factor Toolkit (EFT) or another recognised pollution model.
[20] UK Air Pollution Information System (APIS), 2020, Available at: https://www.apis.ac.uk/
[21] UK Air Pollution Information System (APIS), 2020, Available at: https://www.apis.ac.uk/

- To determine in-combination impacts and to see if the predicted traffic growth will result in a significant change in pollutant concentration, the PC is added to the background levels of each pollutant at, or near to each RAP. When the PC is added to the background level it is referred to as the predicted environmental concentration (PEC). The PEC should be determined across the total time period of the local plans.

- Two PEC scenarios should be modelled to estimate changes in pollution concentration: '**with adoption of preferred land usage allocations**' and '**without adoption of preferred land usage allocations**'. This allows for the impacts of the adopted plans to be compared against a 'do nothing scenario' (i.e., where local plans are not ever adopted). The change in pollution concentration between the 'do something scenario' (i.e., adopt local plans) to be directly assessed against the 'do nothing scenario' across each year of the local plan. The difference between the PEC of the two scenarios can then be determined and expressed as a percentage change of the critical level. If it is found that it is likely that 1% of the critical level will be exceeded (for one or more years across the span of the local plan) then Appropriate Assessment will need to be undertaken (see Chapter 3).

- For many of the RAP's, additional work has already occurred to better understand the background levels of pollutants via a network of diffusion tube monitoring stations installed by the Cannock Chase SAC Partnership. This diffusion tube monitoring provides data on the background concentrations of NO_x and NH_3 for six of the European sites being considered which can be used to complement modelled regional information provided by the APIS website[22]. The locations of these monitoring station are depicted on drawing C159172-01-02 (see Chapter 4).

- Where the Cannock Chase SAC Partnership has not established a monitoring station near to a RAP, the background pollution levels may be able to be derived from data from nearby monitoring stations established by highways or other local authority departments (Environmental Health). If no relevant monitoring station data is available, then modelled background pollution concentration across the whole of the UK (5km grid squares) is available from the APIS website[23].

- For each European site considered, the site-specific critical levels are displayed in Table 2.2. This information is provided by the UK Air Pollution Information System (APIS)[24].

2.3.6. Nitrogen Critical Load

- Nitrogen deposition is a form of eutrophication, derived from the combined nitrogen of NO_x and NH_3. Eutrophication negatively effects the biodiversity and ecological functions of habitats over time, altering soil chemistry and encouraging more competitive plant species. In aquatic habitats, nutrient enrichment frequently results in algal blooms, reducing water quality and resulting in anoxic conditions.

[22] UK Air Pollution Information System (APIS), 2020, Available at: https://www.apis.ac.uk/
[23] UK Air Pollution Information System (APIS), 2020, Available at: https://www.apis.ac.uk/
[24] UK Air Pollution Information System (APIS), 2020, Available at: https://www.apis.ac.uk/

On terrestrial habitats, new plant species can force out less competitive species assemblages, which often constitute the qualifying habitats of a European site, or provide the specific conditions needed to maintain healthy populations of the qualifying species. The nitrogen deposition rate below which these harmful ecological effects would not occur is referred to as the 'critical load'; these are different for each habitat.

- For each European site considered, the site-specific critical loads are displayed in Table 2.2. This information is provided by the UK Air Pollution Information System (APIS)[25].

- The critical loads for nitrogen deposition are described in the units of Kg/N/ha^{1}/year^{1}.

- Deposition rates for nitrogen are calculated by multiplying the ground level concentration of the appropriate pollutant by the appropriate deposition velocity, followed by multiplication with a conversion factor[26]. Deposition velocities and conversion factors for nitrogen deposition NO_x and NH_3 are provided in Table 2.1.

Pollutant	Vegetation type	Deposition velocity	Conversion factor for nitrogen deposition (from µg/m^{3-s} to kg/N/ha^{1}/year^{1})
NO_x	Grassland (sites with short vegetation)	0.0015	96
	Woodland (sites with tall vegetation)	0.003	
NH_3	Grassland (sites with short vegetation)	0.02	260
	Woodland (sites with tall vegetation)	0.03	

Table 2.1: Pollutant Deposition Velocities and Conversion Factors

2.3.7. If the calculations determine the modelled nitrogen deposition will meet or exceed 1% of the lowest range of the site-specific critical load (see Table 2.2), then Appropriate Assessment will need to be undertaken to determine if their levels, location and temporal span of the nitrogen deposition could impact upon the integrity of the European site (see Chapter 3).

2.3.8. **Acid Deposition Critical Load**

[25] UK Air Pollution Information System (APIS), 2020, Available at: https://www.apis.ac.uk/
[26] Deposition velocities and conversion factors provided via Institute of Air Quality Management, (2020), A guide to the assessment of air quality impacts on designated nature conservation sites, V1.1, Available at: https://iaqm.co.uk/text/guidance/air-quality-impacts-on-nature-sites-2020.pdf

- A range of air pollutants can cause the acidification of soil and freshwater. The key pollutants are sulphur, in the form of sulphate ions (SO_4^{2-}), and nitrogen, as nitrate (NO_3^-), nitric acid (HNO_3) and ammonium ($NH4^+$) which arises from ammonia.

- Acid deposition predominantly impacts vegetation indirectly through changes to soil properties, with increasing the soil acidity, tending to increase the mobility of toxic metals (i.e., aluminium and manganese). Acid deposition is also known to result in root damage and nutrient deficiencies within the soils, both of which can stunt plant growth.

- How great a habitat is at risk from acid deposition is mainly dependant on the soil type, bedrock geology, weathering rate and its buffering capacity. In general, habitats dependent on slightly acidic substrate (i.e., heathland or acid grassland) and bog habitats are at greater risk of being adversely affected by increased rates of acid deposition compared with those associated with calcareous soils.

- Traffic emissions generate a negligible amount of additional sulphur, and so increased acid deposition is mostly a result of additional levels of nitrate and ammonium. These deposition rates must be modelled by the AQC, combined and then assessed against the site specific Minimum Critical Load for each European site provided by APIS. The relevant Minimum Critical Loads are provided in Table 2.2.

- It should be noted that, assuming Natural England agrees with the rationale for screening out several European sites from the need for assessment (see Sections 1.3 - 1.10, the determination of Acid Deposition against Minimum Critical Load levels is only possible / applicable for Cannock Chase SAC.

European Site of land parcel	Relevant RAP/s	Q.habitat/s or habitats which Q.species rely	Critical Level (µg/m^{3-s})	Critical Load range (kg/N/ha^{1}/year^{1})	Critical Load N Acid Dep (keq/ha/yr MinCLMaxN)	Pollutants	Recommended Vegetation type when Determining Deposition Velocity	Recommended Deposition Velocity NO_x / NH_3
Cannock Chase SAC	1,2,3	European dry heaths	1	10-20	1.285	NO_x / NH_3	Grassland – for RAP 1&3 Woodland – for RAP 2[27]	0.0015 / 0.003 0.02 / 0.03
		Northern Atlantic wet heaths with *Erica tetralix*	1					
Pasturefields Salt Marsh SAC	4	Inland salt meadows	3	20-30[28]	N/A[29]	NO_x / NH_3	Grassland	0.0015 / 0.003
Chartley Moss	5	Natural dystrophic lakes and ponds[30]	1	3-10	0.621	NO_x / NH_3	Grassland	0.0015 / 0.003
		Transition mires and quaking bogs[31]	1	10-15	0.621			
Aqualate Mere	6, 7	Fen, marsh and swamp (*Juncus effusus / acutiflorus - Galium palustre* rush pasture)	1	15-25	4.506	NO_x / NH_3	Grassland	0.0015 / 0.003
		Fen, marsh and swamp (*Filipendula ulmaria - Angelica sylvestris* mire)	1	15-30	4.506[32]			
		Fen, marsh and swamp (*Phragmites australis* swamp and reed-beds)	1	15-30	N/A[33]			

Table 2.2: Site Specific Critical Levels, Loads and Deposition Velocities (Continues)

[27] Representative of substantial area of mature woodland between road and qualifying habitat
[28] No critical load range is available for inland salt meadows, as such the values for coastal saltmarsh are recommended to be used instead.
[29] Habitat not sensitive to acidification.
[30] Not within 200m of key road
[31] Not within 200m of key road
[32] Habitat not sensitive to acidification.
[33] Habitat not sensitive to acidification.

European Site of land parcel	Relevant RAP/s	Q.habitat/s or habitats which Q.species rely	Critical Level ($\mu g/m^{3-s}$)	Critical Load range ($kg/N/ha^1/year^1$)	Critical Load N Acid Dep (keq/ha/yr MinCLMaxN)	Pollutants	Recommended Vegetation type when Determining Deposition Velocity	Recommended Deposition velocity NO_x / NH_3
Cop Mere	8	Permanent dystrophic lakes, ponds and pools	1	10[34]	N/A[35]	NO_x / NH_3	Grassland	0.0015 / 0.003
Cannock Extension Canal SAC	10, 11	Permanent oligotrophic waters: Softwater lakes	3	10[36]	No critical loads available	NO_x / NH_3	Grassland	0.0015 / 0.003
Fens Pools SAC	12, 13	Permanent oligotrophic waters: Softwater lakes[37]	3	10[38]	No critical loads available	NO_x / NH_3	Woodland[39]	0.02 / 0.03
Betley Mere	14	Fen, marsh and swamp (*Juncus effusus / acutiflorus - Galium palustre* rush pasture)	1	15-25	1.133	NO_x / NH_3	Grassland	0.0015 / 0.003
		Fen, marsh and swamp (*Juncus subnodulosus - Cirsium palustre* fen meadow)	1	15-30	1.133			
		Fen, marsh and swamp (*Phragmites australis* swamp and reed-beds)	1	15-30	N/A[40]			

Table 2.2: (Continued) Site Specific Critical Levels, Loads and Deposition Velocities (Continues)

[34] Range is between 3-10 $kg/N/ha^1/year^1$. The lower end of the range is intended for boreal and alpine lakes, and the higher end of the range for Atlantic softwaters. Site conditions considered to more closely relate to Atlantic softwaters so a critical load of 10 $kg/N/ha^1/year^1$ is recommended.
[35] Habitat not sensitive to acidification.
[36] Range is between 3-10 $kg/N/ha^1/year^1$. The lower end of the range is intended for boreal and alpine lakes, and the higher end of the range for Atlantic softwaters Site conditions considered to more closely relate to Atlantic softwaters so a critical load of 10 $kg/N/ha^1/year^1$ is recommended.
[37] No critical load data in available for the breeding pool utilised by the sites qualifying species (great crested newts). As such the values for softwater lakes are recommended to be used instead
[38] Range is between 3-10 kg/N/ha1/year1. The lower end of the range is intended for boreal and alpine lakes, and the higher end of the range for Atlantic softwaters.. Site conditions considered to more closely relate to Atlantic softwaters so a critical load of 10 $kg/N/ha^1/year^1$ is recommended.
[39] Representative of substantial areas of mature woodland between both key roads and qualifying habitat.
[40] Habitat not sensitive to acidification.

European Site of land parcel	Relevant RAP/s	Q.habitat/s or habitats which Q.species rely	Critical Level ($\mu g/m^{3-s}$)	Critical Load range ($kg/N/ha^{1}/year^{1}$)	Critical Load N Acid Dep (keq/ha/yr MinCLMaxN)	Pollutants	Recommended Vegetation type when Determining Deposition Velocity	Recommended Deposition velocity NO_x / NH_3
Peak District Dales SAC	15 - 21	Various	1	Consult Natural England[41]	Various[42]	NO_x / NH_3	Grassland Woodland	0.0015 / 0.003 0.02 / 0.03
Wybunbury Moss	22	Raised and blanket bogs	1	5-10	0.562	NO_x / NH_3	Grassland	0.0015 / 0.003
Black Firs & Cranberry Bog	23, 24	Broadleaved deciduous woodland	1	10-20	1.855	NO_x / NH_3	Woodland (RAP 23)	0.02 / 0.03
		Raised and blanket bogs	1	5-10	0.574	NO_x / NH_3	Grassland (RAP 24)	0.0015 / 0.003
Oakhanger Moss	25	Broadleaved deciduous woodland	1	10-20	1.946	NO_x / NH_3	Woodland	0.02 / 0.03
		Carex Acutiformis Swamp	3	N/A[43]	N/A[44]	N/A	N/A	N/A
		Rich fens	3	15-30	N/A[45]	NO_x / NH_3	Grassland	0.0015 / 0.003
		Valley mires, poor fens and transition mires	1	10-15	0.9			
		Raised and blanket bogs	1	5-10	0.573			
		Moist and wet oligotrophic grasslands: Molinia caerulea meadows	1	15-25	1.338			

Table 2.2: (Continued) Site Specific Critical Levels, Loads and Deposition Velocities (Continues)

[41] Due the site containing seven different qualifying habitats and uncertainty over their geographic distribution within the considered land parcels of the SAC it is unclear which critical load level/s to use. If it is determined that any parcels of the Peak District Dales SAC do require assessment (see Section 1.7) Natural England should be consulted as to the appropriate critical load/s to test against.
[42] Due the site containing seven different qualifying habitats and uncertainty over their geographic distribution within the considered land parcels of the SAC it is unclear which critical load level/s to use. If it is determined that any parcels of the Peak District Dales SAC do require assessment (see Section 1.7) Natural England should be consulted as to the appropriate critical load/s to test against.
[43] Habitat not sensitive to eutrophication.
[44] Habitat not sensitive to acidification.
[45] Habitat not sensitive to acidification.

European Site of land parcel	Relevant RAP/s	Q.habitat/s or habitats which Q.species rely	Critical Level ($\mu g/m^{3-s}$)	Critical Load range ($kg/N/ha^{1}/year^{1}$)	Critical Load N Acid Dep (keq/ha/yr MinCLMaxN)	Pollutants	Recommended Vegetation type when Determining Deposition Velocity	Recommended Deposition velocity NO_x / NH_3
Bees Nest & Green Clay Pits SAC	26	Sub-atlantic semi-dry calcareous grassland	1	15-25	4.954	NO_x / NH_3	Grassland	0.0015 / 0.003

Table 2.2: (Continued) Site Specific Critical Levels, Loads and Deposition Velocities

3. Appropriate Assessment

3.1. Determining Likely Impacts of Nitrogen Deposition on the Integrity of a European site

3.1.1. A suitably experienced Ecological Consultant (EC) should be engaged and provided with all reports and modelled data completed by the TTC and AQC.

3.1.2. An Appropriate Assessment (AA) must be undertaken of all European sites where all the below criteria have been met:

- The sites qualifying habitats (or habitat on which the qualifying species rely) which are sensitive to air quality impacts;
- The sites qualifying habitats are within 200m of a road/s;
- Quantifiable traffic growth on the identified road/s is a reasonable possibility;
- The traffic growth at one or more RAP meets or exceeds a net-growth of 1000 AADT for vehicles or 200 AADT for HGVs; either alone (derived through use of TRICS) or in-combination with other plans or projects (derived through use of TEMPro); and
- The modelled air pollution concentration meets or exceeds 1% of critical level for NO_x, NH_3 and/or 1% of the site-specific critical load for nitrogen deposition and/or the site specific acid deposition minimum critical load (where applicable) is met or exceeded; either alone or in combination.

3.1.3. The purpose of AA should first be to determine the scope and scale of the possible impacts and to ascertain if they are sufficient to affect the integrity of the European site. The integrity of the European site is unlikely to be affected if it can be demonstrated that "**it is highly unlikely that traffic growth will result in a significant impact upon the qualifying features of the sites, will prevent the attainment of the site's conservation objectives or otherwise impede their delivery**".

3.1.4. At this nascent stage of the establishment of the evidence bases, it is not possible or appropriate to anticipate which of the European sites considered (if any) will need to progress to AA, or the outcome of those assessments.

3.1.5. However, the following are considered material questions that should be answered by the EC at AA to allow the impact of traffic growth on a sites integrity to be robustly understood:

- Does the qualifying habitat occur in any area where the modelled air pollution, nitrogen deposition and acidification concentrations meet or in exceed 1% of the critical level / load.
- What is the total measured area of the qualifying habitat where critical levels/critical loads are likely to be in exceedance?
- Does the total measured area of any qualifying habitat where critical levels/critical loads are likely to be in exceedance represent a notable percentage of its total area within the European site?

- If the habitat is not the qualifying feature, but instead supports a qualifying species, is it likely that the additional levels of air pollution / nitrogen deposition will result in habitat quality degradation sufficient to impact upon the population or distribution of the qualifying species?
- Is there any habitat, ecological or geological features (either within the site, functionally connected to, or between the road and modelled deposition areas) which may buffer, mitigate or exacerbate the likely impacts of air pollution or nitrogen deposition?
- What is the temporal span of the air pollution, nitrogen deposition or acidification concentration (at or in exceedance of critical levels) across the modelled local plan period?

3.1.6. For any European site where the EC determines that the best scientific evidence available does not suggest that 'it is highly unlikely that traffic growth will prevent the attainment of the site's conservation objectives or otherwise impede their delivery', then it should be deemed that a significant impact upon the site is likely, and mitigation against the likely scale or harm must be determined.

3.2. Determining Proportional Mitigation

3.2.1. As with AA, it is not possible or appropriate to anticipate which of the European sites may require mitigation against the impacts of air pollution or nitrogen deposition. However, it is a requirement of HRA that all mitigation is both proportional to the scale of determined impact and securable.

3.2.2. Any proposed mitigation must be discussed and developed in concert with the considerations of Natural England.

3.2.3. It is considered that there are four main mitigation pathways available to the partnership authorities:

- **Policy;**
- **Habitat management;**
- **Redirection of traffic; or**
- **Increased interception or abstraction of air pollution.**

3.2.4. In the future **Policies** which promote or require the following are likely to reduce the level of traffic growth and / air pollution that is discharged for vehicles have the potential to be considered as mitigatory. However, advice provided by Natural England[46] suggest that insufficient evidence is currently available to robustly determine the likely extent by with policies alone are able to reduce air pollution impacts to European sites. As such, if used, any mitigation of impacts via new policy adoption must form part of an extensive suit of other mitigatory measures. Their inclusion should be viewed more as bringing

[46] Communications from Natural England, 8/02/2023

'added benefit' rather than being a 'mitigatory solution' in and of themselves. That notwithstanding, policies which promote the following should be considered:

- Reduction of reliance on private cars via promotion of sustainable transport (train, bus, cycles, walking networks etc.);
- Increased provision for electric cars (including setting expected percentages for charging and incorporation within new residential, employment and provisioning/servicing developments), and
- Improved communication infrastructure (ensuring that developments make provision for high-speed internet and telecommunications potentially reduces the need to travel, particularly during the morning and evening peak hours).

3.2.5. On some European sites it may be possible that additional **habitat management** could be enacted upon the areas where nitrogen deposition is in exceedance of critical load so as to increase the speed of the nitrogen cycle; removing available 'nutrient nitrogen' from the soil at an accelerated rate. However, it must be noted that forms of habitat management that improve the condition of European sites more generally will be considered as a compensatory measure by Natural England and so should be avoided. This mitigation could take the form of:

- Cutting and collecting vegetation to reduce nutrient levels in soil,
- Spot treatment of areas of undesirable 'high nutrient' plant species,
- Encouraging conditions for de-nitrifying plants or bacterial species to become abundant, or
- The introduction of conservation grazing regimes to reduce nutrient levels in soil.

3.2.6. These additional habitat management prescriptions could be funded via proportional developer contributions from new residential and employment developments across the partnership authorities.

3.2.7. However, any new mitigatory habitat management suggested will need to ensure that:

- It is additional to current management being enacted (i.e., through an existing agreed Agri-environment scheme etc.);
- It is possible (physically and legally);
- It has been agreed with the landowner;
- The delivering party has been identified (if other than the landowner);
- That management will occur across a temporal span which equals (and preferably exceeds) the time where deposition will meet or exceed 1% of the critical load;
- That its enactment will not result in additional ecological harm, or-else this harm can also be mitigated against (i.e., disturbance or nesting / overwintering birds, injury to protected species, overgrazing, etc.); and
- That Natural England agree that this management represents mitigation and not compensation.

3.2.8. **Redirection of traffic** could be achieved via the creation of one or more Clean Air Zones (CAZ), which would charge a toll to use certain roads with certain vehicle types. This approach has recently been taken to resolve air pollution and nitrogen deposition issues

impacting upon the Epping Forest SAC[47]. However, it is unclear if such an approach is practical within the partnership authorities' areas, how such a scheme would be developed and how long it would take to enact.

3.2.9. **Increased interception or abstraction of air pollution** may be possible via the creation of addition man-made air pollution control barriers, the planting and management of additional roadside trees or creation of new intervening woodland blocks.

3.2.10. Man-made air pollution control barriers have the benefit of being immediately affective once installed but thy are often considered to be 'unsightly'. For roadside trees and woodland trees will need to be semi-mature before they begin to meaningfully reduce the level of air pollution reaching the qualifying habitats via both mechanical (i.e., acting as a physical barrier increasing deposition rates) and biological means (i.e., nutrient uptake).

3.2.11. The creation of man-made air pollution control barriers or additional tree / woodland planting and management could be funded via proportional developer contributions from new residential and employment developments across the partnership authorities.

3.2.12. However, the practicality of mitigation by this means and the likely levels of air pollution reduction that it could reliably account for, will need to be carefully considered.

3.2.13. For example, tree planting close to highways may not be practical due to lack of available land, health and safety concerns (because of future overhanging trees) or the potential to impact upon pre-existing underground services.

3.2.14. Also (as with habitat management) any suggested mitigation via new tree planting will need to ensure:

- It is possible (physically and legally);
- It has been agreed with the landowner;
- The delivering party has been identified (if other than the landowner); and
- That mitigation will be affective (i.e., the tree will reach a required minimum height/size) by the start of the temporal span which equals (and preferably exceeds) the time where deposition will meet or exceed 1% of critical load.

3.2.15. The species composition and starting age/size of any trees planted will have a material effect on the likely success of the mitigation. For example, the planting of semi-mature fast growing conifer species could quickly establish a new vegetative barrier and maintain it through all seasons.

[47] Epping Forest District Council, (2020), Epping Forest Interim Air Pollution Mitigation Strategy: Managing the Effects of Air Pollution on the Epping Forest Special Area of Conservation, Available at: https://www.eppingforestdc.gov.uk/wp-content/uploads/2021/02/Interim-Epping-Forest-Air-Pollution-Mitigation-Strategy.pdf

3.2.16. However, the planting of new areas of woodlands and roadside trees (especially conifers) could cause several concerns that would need to be considered and addressed prior to the adoption of mitigation by this method, including:

- Impacts upon biodiversity and ecological connectivity;
- Visual impact; and
- Impacts upon landscape character.

Appendix E Natural England Letter (April 2023)

Date: 14 April 2023
Our ref: 427535
Your ref: Air Pollution Evidence Base, Rev B

Customer Services
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Combined Partnership Authorities

BY EMAIL ONLY

Dear Sirs

Planning consultation: Creation of an Air Pollution Evidence Base Brief to Support Local Plan HRA
Location: Staffordshire, Wolverhampton, Walsall, Sandwell and Dudley

Thank you for your consultation on the above report.

Natural England is a non-departmental public body. Our statutory purpose is to ensure that the natural environment is conserved, enhanced, and managed for the benefit of present and future generations, thereby contributing to sustainable development.

The aim of this report is to present a detailed step by step methodology of how the Local Planning Authorities in the above locations will determine the likely air pollution impacts (via increased traffic generation) on several European sites should emerging local plans be adopted.

The report presents a rationale for why certain European sites can be "screened out" from requiring detailed assessment of air quality impacts. For certain European sites that cannot be screened out it presents a methodology for how air quality impacts from emerging local plans will be assessed.

We have reviewed the report and can confirm that it has been prepared in full accordance with Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations. We are therefore able to support the report's methodology and its conclusions.

Should relevant legislation or guidance change the report will need to be reviewed. Should the report itself change please consult us again.

Yours sincerely

Paul Horswill

Dr Paul Horswill
Senior Adviser, West Midlands Team

Appendix D: Wolverhampton Local Plan Screening to Inform the Test of Likely Significance

The Wolverhampton Local Plan (WLP) polices have been screened using the DTA HRA pre-screening categories[1] (**Table 2.1** main report).

1. Introduction

Policy Name	Summary of Policy and Identification of LSEs	Screening Conclusion
n/a	This section provides introductory text, background, context and evidence for the WLP. This section sets out the spatial portrait and the big issues of the WLP. It will not lead to development or any change which may have an LSE on any European site.	Screen Out Administrative text

2. Vision and Strategic Priorities

Policy Name	Summary of Policy and Identification of LSEs	Screening Conclusion
Vision	The proposed Vision for Wolverhampton sets out the aspirations of the WLP to support health and inclusive communities, provide good homes in well-connected neighbourhoods, encourage more local people into good jobs and provide training and a thriving economy in all parts of the City. This is a general aspiration for the WLP and will not trigger a change or development.	Screen Out Category A
Strategic Priorities	To assist with delivery of the vision, the WLP sets out 15 strategic priorities. The objectives are central to achieving the delivery of the vision set out in the WLP. These are general aspirations for the Plan and will not trigger a change or development.	Screen Out Category A

3. Spatial Strategy

Policy Name	Summary of Policy and Identification of LSEs	Screening Conclusion
Policy CSP1 – Spatial Strategy	This policy sets out the delivery of 9,330 new homes and 42.88 ha of employment land and aims to create sustainable mixed communities to meet identified needs. The policy outlines how this growth and sustainable patterns of development will be delivered and identifies the Growth Network as the primary focus for new development. It safeguards the green belt in accordance with national policy and aims to enhance the green belts' value. Development within the Plan area (from the WLP alone and in- combination with development in neighbouring local plan areas (see **Appendix A**) has the potential to cumulatively result in the following LSEs:	Screen In Category L

[1] Tyldesley, D., and Chapman, C. (2013) The Habitats Regulations Assessment Handbook (September) (2013) edition UK: DTA Publications Limited. Available at: www.dtapublications.co.uk

Policy Name	Summary of Policy and Identification of LSEs	Screening Conclusion
	• Air pollution (in-combination LSEs at Cannock Chase SAC, Cannock Extension Canal SAC and Fens Pools SAC); • Water quality and/or quantity (in-combination LSEs on a number of SACs, SPAs and Ramsar sites).; and, • Recreational pressure (in-combination LSEs on Cannock Chase SAC.	
Policy CSP2 – Placemaking: Achieving Well Designed Places	This policy sets out the standards developments must meet to ensure they are well designed to support the needs of diverse local communities and the attractiveness of the City to live and work. Developments must make a positive contribution to place-making and environmental improvement in line with the historic character and local distinctiveness of the location. The urban environment should be safe, accessible, well-connected, integrated and of high-quality. It will not lead to development or any change which may have an LSE on any European site.	Screen Out Category B

4. Infrastructure & Delivery

Policy Name	Summary of Policy and Identification of LSEs	Screening Conclusion
Policy DEL1 – Infrastructure Provision	This policy sets out the requirements for development to be supported by on and off-site infrastructure to serve its needs, is sustainable and ensures the proper planning of the wider area. It outlines the WLP Viability Study which ensures policies are deliverable. It will not lead to development or any change which may have an LSE on any European site.	Screen Out Category F
Policy DEL2 – Balance Between Employment Land and Housing	This policy outlines and sets out the requirements for housing or employment development on windfall sites. This policy ensures that proposals are sustainable and integrate positively with the surrounding area and character. It will not lead to development or any change which may have an LSE on any European site.	Screen Out Category F
Policy DEL3 – Promotion of Fibre to the Premises and 5G Networks	This policy sets out the requirements of development to deliver Fibre to the Premises (FTTP). It also outlines the proposals for 5G Networks which should be sensitively sited and designed to minimise impact on the environment, amenity and character of the surrounding area. It will not lead to development or any change which may have an LSE on any European site.	Screen Out Category F

5. Health & Wellbeing

Policy Name	Summary of Policy and Identification of LSEs	Screening Conclusion
Policy HW1 – Health and Wellbeing	This policy sets out the expectations of all developments to contribute to reducing health inequalities and protecting and improving physical, social and mental health and wellbeing of its residents, employees and visitors. It sets out requirements of development to support vibrant centres that promote choice and	Screen Out Category F

Policy Name	Summary of Policy and Identification of LSEs	Screening Conclusion
	encourage healthy choices. It will not lead to development or any change which may have an LSE on any European site.	
Policy HW2 – Health Impact Assessments	This policy sets out the requirement for development to undertake a Health Impact Assessment dependent on the scale and nature of the proposal to ensure that opportunities for promoting healthy lifestyles are maximised. It will not lead to development or any change which may have an LSE on any European site.	Screen Out Category F
Policy HW3 – Healthcare Facilities	This policy sets out the requirements of new healthcare facilities to ensure they are well-designed, accessible by public transport and located to address accessibility gaps. The policy also requires major housing developments (10+ homes) to be assessed against the capacity of existing healthcare facilities and contribute to healthcare provision or improvement if there is excess demand. It will not lead to development or any change which may have an LSE on any European site.	Screen Out Category F

6. Housing

Policy Name	Summary of Policy and Identification of LSEs	Screening Conclusion
Policy HOU1 – Delivering Sustainable Housing Growth	This policy outlines that sufficient land will be provided to deliver a minimum of 9,330 new homes over the Plan period and sets out the sources of supply. It requires development to make best use of available land and infrastructure and prioritises achieving the high quality design of allocations. Development within the Plan area (from the WLP alone and in- combination with development in neighbouring local plan areas (see **Appendix A**) has the potential to cumulatively result in the following LSEs: • Air pollution (in-combination LSEs at Cannock Chase SAC, Cannock Extension Canal SAC and Fens Pools SAC); • Water quality and/or quantity (in-combination LSEs on a number of SACs, SPAs and Ramsar sites).; and, • Recreational pressure (in-combination LSEs on Cannock Chase SAC.	Screen In Category L
Policy HOU2 – Housing Density, Type and Accessibility	This policy sets out the requirements of the density, type and accessibility of new housing to ensure local need is met and achieve high quality design. The access standards for differing housing types and densities in relation to employment, health, fresh food and education are outlined. It will not lead to development or any change which may have an LSE on any European site.	Screen Out Category F
Policy HOU3 – Delivering Affordable, Accessible and Self Build / Custom Build Housing	The policy sets out the delivery of affordable housing to meet the needs of existing and future residents. It also sets out the requirements of new developments to be accessible and adaptable. The supply and requirements of self-build and custom build plots is outlined. It will not lead to development or any change which may have an LSE on any European site.	Screen Out Category F

Policy Name	Summary of Policy and Identification of LSEs	Screening Conclusion
Policy HOU4 – Housing for People with Specific Needs	This policy sets out the requirements of proposals for specific housing to meet identified needs including children's homes, care homes, nursing homes and extra care facilities. It will not lead to development or any change which may have an LSE on any European site.	Screen Out Category F
Policy HOU5 – Accommodation for Gypsies and Travellers and Travelling Showpeople	This policy protects existing Gypsy and Traveller and Travelling Showpeople sites and sets out the provision of at least 14 additional permanent pitches by 2032. It sets out the criteria against which proposals for permanent pitches and plots will be assessed. Development within the Plan area (from the WLP alone and in- combination with development in neighbouring local plan areas (see **Appendix A**) has the potential to cumulatively result in the following LSEs: • Air pollution (in-combination LSEs at Cannock Chase SAC, Cannock Extension Canal SAC and Fens Pools SAC); • Water quality and/or quantity (in-combination LSEs on a number of SACs, SPAs and Ramsar sites).; and, • Recreational pressure (in-combination LSEs on Cannock Chase SAC.	Screen In Category L
Policy HOU6 – Education Facilities	This policy protects existing education facilities and outlines the requirements of new nursery, school and higher education developments. It sets out the requirement of housing developments to contribute to new and improved education facilities where there is the demand. It will not lead to development or any change which may have an LSE on any European site.	Screen Out Category F
Policy HOU7 – Houses in Multiple Occupation	This policy sets out the requirements for the creation of Houses in Multiple Occupation. It will not lead to development or any change which may have an LSE on any European site.	Screen Out Category F

7. Economy

Policy Name	Summary of Policy and Identification of LSEs	Screening Conclusion
Policy EMP1 – Providing for Economic Growth and Jobs	This policy provides for the delivery of at least 42.88ha of employment development on Employment Development Sites for Use Classes E(g)(ii), E(g)(iii), B2 and B8 over the Plan period to support economic growth and increase productivity. The policy safeguards sites for industrial employment uses and allocates employment land. Development within the Plan area (from the WLP alone and in- combination with development in neighbouring local plan areas (see **Appendix A**) has the potential to cumulatively result in the following LSEs: • Air pollution (in-combination LSEs at Cannock Chase SAC, Cannock Extension Canal SAC and Fens Pools SAC); and, • Water quality and/or quantity (in-combination LSEs on a number of SACs, SPAs and Ramsar sites).	Screen In Category L
Policy EMP2 – Strategic Employment Areas	This policy identifies the Strategic Employment Areas and safeguards these allocations for manufacturing and logistic uses within Use Classes E(g)(ii), E(g)(iii), B2 and B8. It sets out the criteria for ancillary employment	Screen In

Policy Name	Summary of Policy and Identification of LSEs	Screening Conclusion
	generating uses such as childcare facilities and small-scale food and drink outlets on these allocations. Development within the Plan area (from the WLP alone and in- combination with development in neighbouring local plan areas (see **Appendix A**) has the potential to cumulatively result in the following LSEs: • Air pollution (in-combination LSEs at Cannock Chase SAC, Cannock Extension Canal SAC and Fens Pools SAC); and, • Water quality and/or quantity (in-combination LSEs on a number of SACs, SPAs and Ramsar sites).	Category L
Policy EMP3 – Local Employment Areas	This policy identifies Local Employment Areas and safeguards these allocations to provide the needs of local investment including industrial, warehousing (E(g)(ii), E(g)(iii), B2 and B8 use) and service activity. It sets out the criteria for ancillary employment generating uses such as childcare facilities and small-scale food and drink outlets on these allocations. Development within the Plan area (from the WLP alone and in- combination with development in neighbouring local plan areas (see **Appendix A**) has the potential to cumulatively result in the following LSEs: • Air pollution (in-combination LSEs at Cannock Chase SAC, Cannock Extension Canal SAC and Fens Pools SAC); and, • Water quality and/or quantity (in-combination LSEs on a number of SACs, SPAs and Ramsar sites).	Screen In Category L
Policy EMP4 – Other Employment Sites	This policy supports employment development on occupied land, or if vacant was last used, for employment reasons for new industrial employment uses (within Class E(g)(ii), E(g)(iii) and Class B2 and B8) or for housing or other non-ancillary non-industrial employment uses. It sets out the requirements for their development. The policy supports employment development within the Plan area. Development within the Plan area (from the WLP alone and in- combination with development in neighbouring local plan areas (see **Appendix A**) has the potential to cumulatively result in the following LSEs: • Air pollution (in-combination LSEs at Cannock Chase SAC, Cannock Extension Canal SAC and Fens Pools SAC); and, • Water quality and/or quantity (in-combination LSEs on a number of SACs, SPAs and Ramsar sites).	Screen In Category L
Policy EMP5 – Improving Access to the Labour Market	This policy requires new major job-creating development to demonstrate how job opportunities will be available to Wolverhampton residents, particularly for priority groups and deprived areas. It will not lead to development or any change which may have an LSE on any European site.	Screen Out Category F
Policy EMP6 – Cultural Facilities and the Visitor Economy	This policy protects and supports the enhancement and expansion of major cultural, tourist and leisure facilities. It sets out the requirements of development proposals to ensure Wolverhampton is attractive as a visitor destination and aims to improve public transport and the canal network. It will not lead to development or any change which may have an LSE on any European site.	Screen Out Category F

8. The Wolverhampton Centres

Policy Name	Summary of Policy and Identification of LSEs	Screening Conclusion
Policy CEN1 – Centres and Centre Uses	The policy outlines the priorities for Wolverhampton's centres to ensure the community needs are met whilst repurposing and diversifying the centres through a mix of commercial, business and service uses. It sets out the hierarchy of centres to ensure development is reflective of the scale, role and function of the centres. It will not lead to development or any change which may have an LSE on any European site.	Screen Out Category F
Policy CEN2 – Wolverhampton's Centres	The policy sets out the priorities of each tier of the hierarchy of centres and identifies Wolverhampton City Centre as a key focus in the Growth Network (Policy CSP1) and the location for large-scale proposals and residential provision (target of 4,676 new homes by 2042). The policy supports retail, office, leisure and complementary use development in the City Centre. Bliston and Wednesfield Town Centres form the Core Regeneration Areas and 29 smaller areas form the District and Local Centres. Development within the Plan area (from the WLP alone and in- combination with development in neighbouring local plan areas (see **Appendix A**) has the potential to cumulatively result in the following LSEs: • Air pollution (in-combination LSEs at Cannock Chase SAC, Cannock Extension Canal SAC and Fens Pools SAC); • Water quality and/or quantity (in-combination LSEs on a number of SACs, SPAs and Ramsar sites).; and, • Recreational pressure (in-combination LSEs on Cannock Chase SAC.	Screen In Category L
Policy CEN3 – Provision of Local Facilities	This policy sets out the requirements of proposals for small-scale local facilities. The policy protects local facilities where it would increase the number of people not living within a safe, convenient walking distance from such facilities. It will not lead to development or any change which may have an LSE on any European site.	Screen Out Category F
Policy CEN4 – Edge-of-Centre and Out-of-Centre Development	This policy sets out the requirements of edge-of-centre and out-of-centre proposals to meet the sequential test, to demonstrate they will be well-integrated, and the impact test, to ensure significant adverse impacts are prevented. It will not lead to development or any change which may have an LSE on any European site.	Screen Out Category F

9. Transport

Policy Name	Summary of Policy and Identification of LSEs	Screening Conclusion
Policy TRAN1 – Priorities for the Development of the Transport Network	This policy safeguards land required for priority transport projects and requires all new developments to provide adequate access for all modes of travel including walking, cycling and public transport. It will not lead to development or any change which may have an LSE on any European site.	Screen Out Category F

Policy Name	Summary of Policy and Identification of LSEs	Screening Conclusion
Policy TRAN2 – Safeguarding the Development of the Key Route Network	This policy safeguards land required for the implementation of improvements to the Key Route Network to ensure the network serves the main strategic demand flows of people and freight across Wolverhampton. It will not lead to development or any change which may have an LSE on any European site.	Screen Out Category F
Policy TRAN3 – Managing Transport Impacts of New Development	This policy requires development that is likely to have significant transport implications to have sufficient mitigation through sustainable transport facilities including walking, cycling, public transport and car sharing. It will not lead to development or any change which may have an LSE on any European site.	Screen Out Category F
Policy TRAN4 – The Efficient Movement of Freight	This policy encourages the movement of freight by sustainable modes of transport such as rail and waterways and directs proposals with significant freight movements to sites with satisfactory access to the Key Route Network. This policy safeguards existing and disused railway lines and sites with existing and potential access to the rail network for freight. It will not lead to development or any change which may have an LSE on any European site.	Screen Out Category F
Policy TRAN5 – Creating Coherent Networks for Cycling and for Walking	This policy sets out the work between the Black Country Authorities to create and maintain a comprehensive, high quality cycle network and requires new developments to have good walking and cycling links to public transport. It will not lead to development or any change which may have an LSE on any European site.	Screen Out Category F
Policy TRAN6 – Influencing the Demand for Travel and Travel Choices	This policy sets out the requirements of traffic management in Wolverhampton including easing traffic in the centres and wider region by promoting Smarter Choices. It will not lead to development or any change which may have an LSE on any European site.	Screen Out Category F
Policy TRAN7 – Parking Management	This policy sets out the sustainable delivery and management of parking in centres and beyond as a priority for traffic management. The policy considers the management and control of parking, type of parking, maximum parking standards and the location of parking. It will not lead to development or any change which may have an LSE on any European site.	Screen Out Category F
Policy TRAN8 – Planning for Low Emission Vehicles	This policy promotes the increased use of low emission vehicles through the provision of charging infrastructure in new developments and public locations and exploring alternative low emission vehicle technologies. It will not lead to development or any change which may have an LSE on any European site.	Screen Out Category F

10. Environment and Climate Change

Policy Name	Summary of Policy and Identification of LSEs	Screening Conclusion
Policy ENV1 – Nature Conservation	This policy safeguards nature conservation inside and outside development boundaries and requires all development to have a positive contribution to biodiversity and geodiversity. This is a protective policy and will not lead to development or any change which may have an LSE on any European site.	Screen Out Category D

Policy ENV2 – Development Affecting Cannock Chase Special Area of Conservation	This policy requires an Appropriate Assessment to be conducted for developments within 15km of Cannock Chase SAC which results in a net increase in homes or visitor accommodation. Sufficient mitigation will be required where development is likely to have an adverse impact on the integrity of Cannock Chase SAC. This is a protective policy and will not lead to development or any change which may have an LSE on any European site. It will provide mitigation and will be discussed further in the Appropriate Assessments.	Screen In Category M
Policy ENV3 – Nature Recovery and Biodiversity Net Gain	This policy requires development to consider the Local Nature Recovery Strategy, follow the mitigation hierarchy and protect, enhance, restore and create wildlife habitat and green infrastructure. The policy requires 10% Biodiversity Net Gain (BNG) and sets out the requirements for its provision. This is a protective policy and will not lead to development or any change which may have an LSE on any European site.	Screen Out Category D
Policy ENV4 – Trees and Hedgerows	This policy supports the planting of new trees and woodlands in appropriate locations to increase tree cover in Wolverhampton to 20% by 2035. The policy does not permit development resulting in the loss or damage to ancient trees or woodland. The policy protects hedgerows before and during development. This is a protective policy and will not lead to development or any change which may have an LSE on any European site.	Screen Out Category D
Policy ENV5 – Historic Character and Local Distinctiveness	This policy requires development to sustain and enhance the locally distinctive character and historic environment of Wolverhampton and the wider Black Country. It will not lead to development or any change which may have an LSE on any European site.	Screen Out Category D
Policy ENV6 – Geodiversity and the Black Country UNESCO Global Geopark	This policy encourages development proposals to positively contribute to the protection and enhancement of geodiversity. This policy promotes public access to and appreciation of geodiversity. This is a protective policy and will not lead to development or any change which may have an LSE on any European site.	Screen Out Category D
Policy ENV7 – Canal Network	This policy focuses on the canal network for future development as a high-quality environment with enhance accessibility for non-car modes of transport. The policy sets out the requirements of development proposals likely to affect the canal network. It will not lead to development or any change which may have an LSE on any European site.	Screen Out Category D
Policy ENV8 – Open Space and Recreation	This policy sets out the role of development proposals in improving, providing and protecting open space to enhance the environment and mental and physical health and wellbeing. The policy will not permit development that will reduce the value of the open space and recreation network in Wolverhampton.	Screen Out Category F
Policy ENV9 – Playing Fields and Sports Facilities	This policy protects existing playing fields and sports facilities and sets out the requirements for new built sports facilities and developments in terms of sports facility provision. It will not lead to development or any change which may have an LSE on any European site.	Screen Out Category F
Policy ENV10 – High Quality Design	This policy outlines the requirement of development to demonstrate designs to the highest standards that are reflective of the Wolverhampton context to create a strong sense of place. Development should also be designed to mitigate climate change impacts. It will not lead to development or any change which may have an LSE on any European site.	Screen Out Category F

Policy ENV11 – Air Quality	This policy outlines the Strategic Approach to address poor air quality including a modal shift, an integrated zero-emission public transport system, and the protection and provision of green open spaces. It will not lead to development or any change which may have an LSE on any European site.	Screen Out Category D
Policy ENV12 – Flood Risk and Water Quality	This policy seeks to minimise the probability and consequences of flooding. The policy sets out the requirements of all developments to apply the Sequential Test and Exception Test. It also requires site allocations to comply with advice from Severn Trent Water and any relevant water cycle study evidence in order to minimise impacts on wastewater infrastructure which could harm water quality. The policy therefore also protects and enhances water quality. This is a protective policy and will not lead to development or any change which may have an LSE on any European site.	Screen Out Category D
Policy ENV13 – Sustainable Drainage Systems and Surface Water Management	This policy requires all developments to incorporate Sustainable Drainage Systems (SuDS) and sets out the design standards. This is a protective policy and will not lead to development or any change which may have an LSE on any European site.	Screen Out Category D
Policy ENV14 – Energy and Sustainable Design	This policy supports the development of renewable or low carbon energy. The policy sets out the requirements of housing and non-residential developments to meet energy and water standards. It will not lead to development or any change which may have an LSE on any European site.	Screen Out Category F

11. Waste

Policy Name	Summary of Policy and Identification of LSEs	Screening Conclusion
Policy W1 – Waste Infrastructure – Future Requirements	This policy requires major developments to minimise waste production and re-use and recover waste materials. The policy sets out the requirements for the support of waste management facilities. It will not lead to development or any change which may have an LSE on any European site.	Screen Out Category F
Policy W2 – Safeguarding Waste Sites	This policy safeguards all existing waste management facilities and does not permit development near or adjacent to existing waste management sites where there is potential for conflict between uses. It will not lead to development or any change which may have an LSE on any European site.	Screen Out Category F
Policy W3 – Locational Requirements for New Waste Management Facilities	This policy outlines the preferred locations for waste management facilities . Development within the Plan area (from the WLP alone and in- combination with development in neighbouring local plan areas (see **Appendix A**) has the potential to cumulatively result in the following LSEs: • Air pollution (in-combination LSEs at Cannock Chase SAC, Cannock Extension Canal SAC and Fens Pools SAC); and, • Water quality and/or quantity (in-combination LSEs on a number of SACs, SPAs and Ramsar sites).	Screen In Category L
Policy W4 – Key Considerations for New Waste Facilities	This policy outlines the requirements of all waste management proposals in contributing to the spatial objective of the WLP. It outlines the required supporting information for waste applications. It will not lead to development or any change which may have an LSE on any European site.	Screen Out Category F

Policy W5 – Resource Management and New Development	This policy outlines the requirements of waste management in new developments. It will not lead to development or any change which may have an LSE on any European site.	Screen Out Category F

12. Minerals

Policy Name	Summary of Policy and Identification of LSEs	Screening Conclusion
Policy MIN1 – Mineral Production	This policy encourages all new development to be resource efficient by maximising the use of recycled mineral products in construction. It also safeguards existing permitted secondary and recycled aggregate sites. It will not lead to development or any change which may have an LSE on any European site.	Screen Out Category F
Policy MIN2 –Safeguarding Minerals	This policy safeguards mineral deposits identified as being, or may become of, economic importance. The policy outlines the buffer zone for development at existing mineral sites. It will not lead to development or any change which may have an LSE on any European site.	Screen Out Category F
Policy MIN3 – Key Considerations for Mineral Development	This policy sets out the requirements of mineral developments to protect the environment, public amenity and health and surrounding land uses. It will not lead to development or any change which may have an LSE on any European site.	Screen Out Category F

13. Site Allocations

Policy Name	Summary of Policy and Identification of LSEs	Screening Conclusion
	See Appendix E	See Appendix E

14. Monitoring and Review

Policy Name	Summary of Policy and Identification of LSEs	Screening Conclusion
n/a	This section provides a description of the monitoring and review approach for the WLP. This section will not lead to development or any change which may have an LSE on any European site.	Screen Out Administrative text

Appendix E: Wolverhampton Local Plan Allocation Screening Evaluation

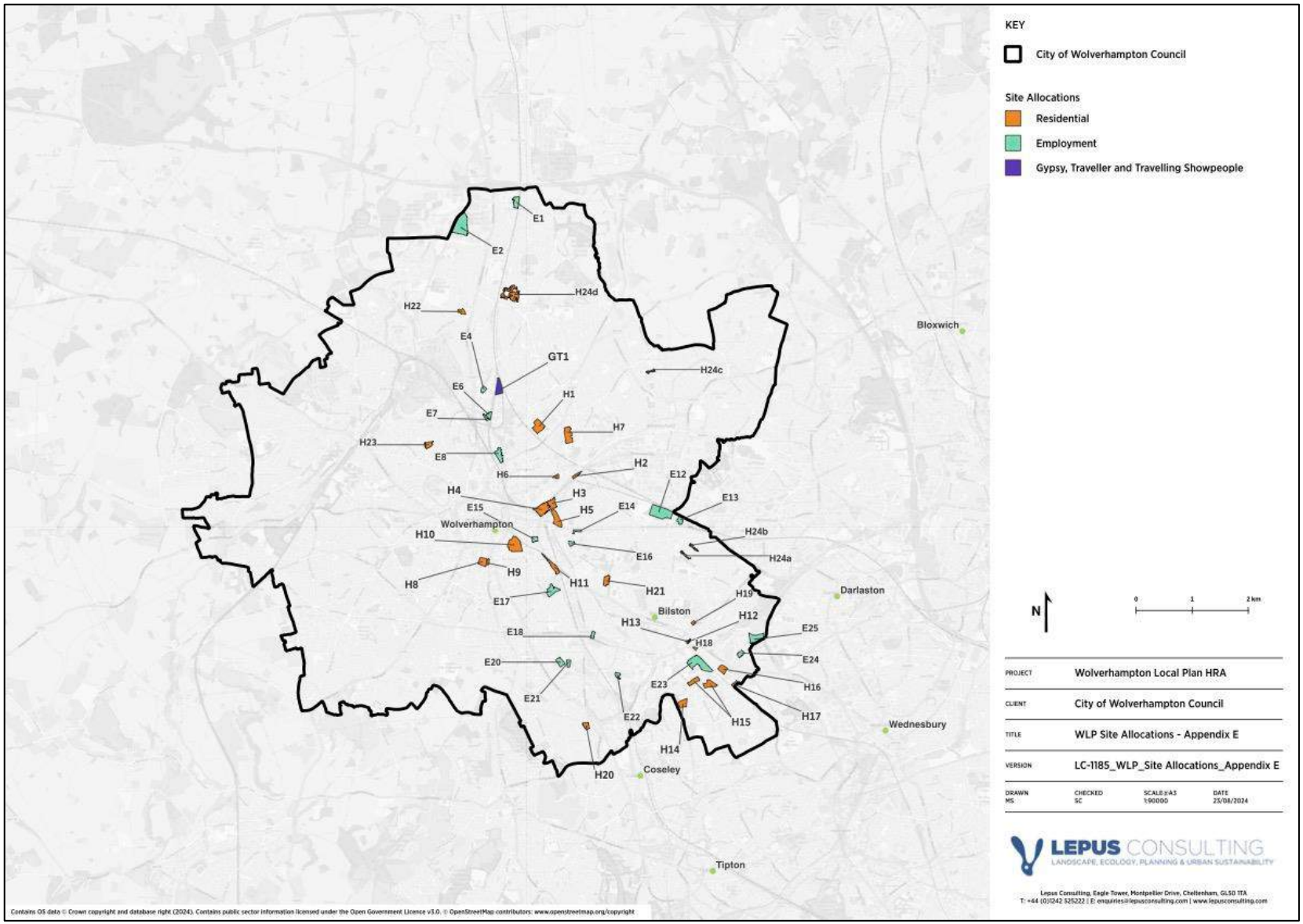

Figure E.1: *WLP site allocations map*

Table Notes:

The following allocations are set out in Chapters 13 of the Regulation 19 Draft Local Plan.

Air Quality LSEs: All site allocations set out in the WLP have the potential to act cumulatively to increase traffic flows on the local and wider road network. An increase in traffic related emissions has the potential to change air quality. Applying Natural England's screening thresholds, air quality likely significant effects (LSEs) are considered possible at those European sites listed in **Section 3.4** of the Regulation 19 HRA report. Growth at all allocations (listed below) has the potential to contribute towards a change in air quality, in combination with other plans and projects (see **Appendix A**). All allocations below have therefore been screened in under Category L.

Water Quality and Quantity LSEs: All site allocations set out in the WLP (including those listed below) have the potential to act in combination with one another to increase the quantity of water required for treatment at Wastewater Treatment Works (WwTWs). This may result in the deterioration of downstream water quality. In addition, an increase in water demand from new development increase demand for water supply which may also affect water sensitive European sites. Taking a precautionary approach, hydrology impacts from the combined effect of all developments together, acting in-combination with other plans and projects (see Appendix A), have the potential to result in LSEs at hydrologically connected European sites listed in **Section 3.5** of the Regulation 19 HRA report. Water quality and quantity impacts at all allocations listed below have therefore been screened in under Category L.

Recreational pressure LSEs: As noted in **Section 3.6** of the Regulation 19 HRA Report, new residential development which is located within 15km of Cannock Chase SAC has the potential to adverse likely significant recreational effects. The assessment (**Table E.1**) below identifies those allocations that are located within the Cannock Chase 15km ZOI.

Urbanisation effects LSEs: Urbanisation effects include impacts such as noise disturbance, lighting effects, cat predation, fly-tipping, wildfire, littering, vandalism and fragmentation of habitat. As set out in **Section 3.7** of the Regulation 19 HRA Report there are no European sites within 500m of the Plan area and therefore urbanisation LSEs have been scoped out.

Table E.1: *Screening summary for site allocations set out in Chapter 13 of the WLP*

Site Ref.	Site Name	Net new homes	Area (ha) Predominantly brownfield / greenfield?	Potential for an increase in recreational pressure
Stafford Road Core Regeneration Area				
H1	Bluebird Industrial Estate and site to rear, Park Lane	Approx. 130 dwellings	3.2 Brownfield	This allocation is not located within 15km of Cannock Chase SAC, identified as susceptible to LSEs from recreational pressure associated with the WLP in Section 3.6 of the Regulation 19 HRA report.
GT1	Former Bushbury Reservoir, Showell Road	Approx. 12 pitches (Gypsy and Traveller site)	0.3 Greenfield	This allocation is not located within 15km of Cannock Chase SAC, identified as susceptible to LSEs from recreational pressure associated with the WLP in Section 3.6 of the Regulation 19 HRA report.
E1	Wolverhampton Business Park	n/a	1.77 Greenfield	This site is a potential employment allocation and therefore will not have a recreational LSE.
E2	Rear of IMI Marstons, Wobaston Road	n/a	7.24 Brownfield	This site is a potential employment allocation and therefore will not have a recreational LSE.
E4	Former Strykers, Bushbury Lane	n/a	0.77 Brownfield	This site is a potential employment allocation and therefore will not have a recreational LSE.
E6	Mammoth Drive, Wolverhampton Science Park	n/a	0.83 Greenfield	This site is a potential employment allocation and therefore will not have a recreational LSE.

Site Ref.	Site Name	Net new homes	Area (ha) Predominantly brownfield / greenfield?	Potential for an increase in recreational pressure
E7	Stratosphere Site, Wolverhampton Science Park	n/a	4.2 Greenfield	This site is a potential employment allocation and therefore will not have a recreational LSE.
E8	Cross Street North / Crown Street	n/a	2.14 Brownfield	This site is a potential employment allocation and therefore will not have a recreational LSE.
Wednesfield Core Regeneration Area				
H2	Former G & P Batteries, Grove Street, Heath Town	Approx 56 dwellings	0.62 Brownfield	This allocation is not located within 15km of Cannock Chase SAC, identified as susceptible to LSEs from recreational pressure associated with the WLP in Section 3.6 of the Regulation 19 HRA report.
H3	East of Qualcast Road, Canalside South	Approx. 152 dwellings	2 Greenfield	This allocation is not located within 15km of Cannock Chase SAC, identified as susceptible to LSEs from recreational pressure associated with the WLP in Section 3.6 of the Regulation 19 HRA report.
H4	West of Qualcast Road, Canalside South	Approx. 228 dwellings	3 Brownfield	This allocation is not located within 15km of Cannock Chase SAC, identified as susceptible to LSEs from recreational pressure associated with the WLP in Section 3.6 of the Regulation 19 HRA report.
H5	West of Colliery Road, Horseley Fields	Approx. 90 dwellings	2 Brownfield	This allocation is not located within 15km of Cannock Chase SAC, identified as susceptible to LSEs from recreational pressure

Site Ref.	Site Name	Net new homes	Area (ha) Predominantly brownfield / greenfield?	Potential for an increase in recreational pressure
				associated with the WLP in Section 3.6 of the Regulation 19 HRA report.
H6	Heath Town Estate Masterplan – Chervil Rise	Approx. 54 dwellings	0.49 Brownfield	This allocation is not located within 15km of Cannock Chase SAC, identified as susceptible to LSEs from recreational pressure associated with the WLP in Section 3.6 of the Regulation 19 HRA report.
H7	New Park Village Housing Renewal (Ellerton Walk)	Approx. 188 dwellings (-17 net)	3.26 Brownfield	This allocation is not located within 15km of Cannock Chase SAC, identified as susceptible to LSEs from recreational pressure associated with the WLP in Section 3.6 of the Regulation 19 HRA report.
E12	Land at Neachells Lane	n/a	6.73 Greenfield	This site is a potential employment allocation and therefore will not have a recreational LSE.
E13	Land rear of Keyline Builders, Neachells Lane / Noose Lane	n/a	1.22 Greenfield	This site is a potential employment allocation and therefore will not have a recreational LSE.
Bliston Core Regeneration Area				
H8	Dobbs Street, Blakenhall	Approx. 266 dwellings	1.35 Brownfield	This allocation is not located within 15km of Cannock Chase SAC, identified as susceptible to LSEs from recreational pressure associated with the WLP in Section 3.6 of the Regulation 19 HRA report.

Site Ref.	Site Name	Net new homes	Area (ha) Predominantly brownfield / greenfield?	Potential for an increase in recreational pressure
H9	Dudley Road / Bell Place, Blakenhall	Approx. 100 dwellings	0.36 Brownfield	This allocation is not located within 15km of Cannock Chase SAC, identified as susceptible to LSEs from recreational pressure associated with the WLP in Section 3.6 of the Regulation 19 HRA report.
H11	Delta Trading Estate, Bliston Road	Approx. 80 dwellings	2 Brownfield	This allocation is not located within 15km of Cannock Chase SAC, identified as susceptible to LSEs from recreational pressure associated with the WLP in Section 3.6 of the Regulation 19 HRA report.
H12	Land at Hall Street / The Orchard, Bliston Town Centre	Approx. 21 dwellings	0.12 Brownfield	This allocation is not located within 15km of Cannock Chase SAC, identified as susceptible to LSEs from recreational pressure associated with the WLP in Section 3.6 of the Regulation 19 HRA report.
H13	Former Pipe Hall, The Orchard, Bliston Town Centre	Approx. 38 dwellings	0.13 Brownfield	This allocation is not located within 15km of Cannock Chase SAC, identified as susceptible to LSEs from recreational pressure associated with the WLP in Section 3.6 of the Regulation 19 HRA report.
H14	Lane Street / Highfields Road, Bradley	Approx. 72 dwellings	1.79 Brownfield	This allocation is not located within 15km of Cannock Chase SAC, identified as susceptible to LSEs from recreational pressure associated with the WLP in Section 3.6 of the Regulation 19 HRA report.
H15	Greenway Road, Bradley	Approx. 180 dwellings	3.52	This allocation is not located within 15km of Cannock Chase SAC, identified as susceptible to LSEs from recreational pressure

Site Ref.	Site Name	Net new homes	Area (ha) Predominantly brownfield / greenfield?	Potential for an increase in recreational pressure
			Brownfield	associated with the WLP in Section 3.6 of the Regulation 19 HRA report.
H16	Former Loxdale Primary School, Chapel Street, Bradley	Approx. 100 dwellings	1.3 Brownfield	This allocation is not located within 15km of Cannock Chase SAC, identified as susceptible to LSEs from recreational pressure associated with the WLP in Section 3.6 of the Regulation 19 HRA report.
H17	South of Oxford Street, Bliston	Approx. 20 dwellings	0.45 Greenfield	This allocation is not located within 15km of Cannock Chase SAC, identified as susceptible to LSEs from recreational pressure associated with the WLP in Section 3.6 of the Regulation 19 HRA report.
H18	Land at Railway Drive, Bliston	Approx. 47 dwellings	0.28 Greenfield	This allocation is not located within 15km of Cannock Chase SAC, identified as susceptible to LSEs from recreational pressure associated with the WLP in Section 3.6 of the Regulation 19 HRA report.
H19	Former Bliston College, 40 and adjoining land, Mount Pleasant, Bliston Town Centre	Approx. 64 dwellings	0.38 Brownfield	This allocation is not located within 15km of Cannock Chase SAC, identified as susceptible to LSEs from recreational pressure associated with the WLP in Section 3.6 of the Regulation 19 HRA report.
E14	Chillington Fields	n/a	0.57 Greenfield	This site is a potential employment allocation and therefore will not have a recreational LSE.

Site Ref.	Site Name	Net new homes	Area (ha) Predominantly brownfield / greenfield?	Potential for an increase in recreational pressure
E15	Powerhouse, Commercial Road	n/a	0.85 Brownfield	This site is a potential employment allocation and therefore will not have a recreational LSE.
E16	Hickman Avenue	n/a	0.69 Brownfield	This site is a potential employment allocation and therefore will not have a recreational LSE.
E17	Former MEB Site, Major Street / Dixon Street	n/a	2.5 Greenfield	This site is a potential employment allocation and therefore will not have a recreational LSE.
E18	Millfields Road, Ettingshall	n/a	0.7 Brownfield	This site is a potential employment allocation and therefore will not have a recreational LSE.
E20	South of Inverclyde Drive	n/a	1.44 Brownfield	This site is a potential employment allocation and therefore will not have a recreational LSE.
E21	Rear of Spring Road	n/a	0.72 Brownfield	This site is a potential employment allocation and therefore will not have a recreational LSE.
E22	Springvale Avenue	n/a	0.71 Greenfield	This site is a potential employment allocation and therefore will not have a recreational LSE.
E23	Bliston Urban Village, Bath Street	n/a	6.02 Greenfield	This site is a potential employment allocation and therefore will not have a recreational LSE.

Site Ref.	Site Name	Net new homes	Area (ha) Predominantly brownfield / greenfield?	Potential for an increase in recreational pressure
E24	Dale St, Bliston	n/a	0.91 Brownfield	This site is a potential employment allocation and therefore will not have a recreational LSE.
E25	South of Citadel Junction, Murdoch Road, Bliston	n/a	3.25 Greenfield	This site is a potential employment allocation and therefore will not have a recreational LSE.
Neighbourhoods Area				
H20	Former Rookery Lodge, Woodcross Lane	Approx. 16 dwellings	0.25 Greenfield	This allocation is not located within 15km of Cannock Chase SAC, identified as susceptible to LSEs from recreational pressure associated with the WLP in Section 3.6 of the Regulation 19 HRA report.
H21	Former Stowheath Centres, Stowheath Lane	Approx. 53 dwellings	1 Brownfield	This allocation is not located within 15km of Cannock Chase SAC, identified as susceptible to LSEs from recreational pressure associated with the WLP in Section 3.6 of the Regulation 19 HRA report.
H22	Former Probert Court / Health Centre, Probert Road	Approx. 35 dwellings	0.88 Brownfield	This allocation is located within 15km of Cannock Chase SAC, identified as susceptible to LSEs from recreational pressure associated with the WLP in Section 3.6 of the Regulation 19 HRA report.
H23	Former Gym, Craddock Street	Approx. 48 dwellings	1.2 Brownfield	This allocation is not located within 15km of Cannock Chase SAC, identified as susceptible to LSEs from recreational pressure

Site Ref.	Site Name	Net new homes	Area (ha) Predominantly brownfield / greenfield?	Potential for an increase in recreational pressure
				associated with the WLP in Section 3.6 of the Regulation 19 HRA report.
H24	Tarrans Housing Renewal (Portobello, Wood End, Lincoln Green)	Approx. 138 dwellings (H24c – 12 homes and H24d – 99 homes)	5.46 Brownfield	This allocation (H24c and H24d) is located within 15km of Cannock Chase SAC, identified as susceptible to LSEs from recreational pressure associated with the WLP in Section 3.6 of the Regulation 19 HRA report.

Habitats Regulations Assessments

Sustainability Appraisals

Strategic Environmental Assessments

Landscape Character Assessments

Landscape and Visual Impact Assessments

Green Belt Reviews

Expert Witness

Ecological Impact Assessments

Habitat and Ecology Surveys

Biodiversity Net Gain

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