Air Quality Note:
Watling Street Business Park (CE20)

March 2024

Experts in air quality management & assessment

Document Control

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1 Introduction

1.1 This Technical Note considers the potential air quality impacts upon human and ecological receptors, associated with the allocation of the Watling Street Business Park (the Site) within the emerging Cannock Chase Local Plan. Within the Local Plan, the Site is described as CE20.

2 Human Health

2.1 Watling Street Business Park (the Site) was initially given a - - score for "Pollution" in the Sustainability Appraisal[2]. With respect to air quality, this is due to the proximity to an AQMA. The length of the A5 through Cannock Chase has been designated an AQMA (known as AQMA 2). However, this does not mean that the air quality objectives are currently being exceeded along its entire length, nor that this will continue to be the case throughout the lifetime of the plan.

2.2 Although challenged, the March 2021 Integrated Impact Assessment[1] stated that, *"In relation to SA objective 2, air pollution has been considered in terms of the potential for development to result in higher levels of traffic occurring within declared AQMAs. Due to the strategic nature of SA it is considered that this approach is proportionate. Site CE20 is located within very close proximity of the A5 where an AQMA has been declared. It is considered most probable that access to the site would be provided directly via the A5 or via Lime Lane which connects to that route by The Turf roundabout. A significant negative effect has therefore been recorded in relation to this SA objective."*

2.3 This statement was repeated in the February 2024 draft Integrated Impact Assessment.[2]

2.4 According to the 2021 Integrated Impact Assessment, all employment sites have been given a negative score for air pollution with the exception of RE2(a), where it is stated that it *"is unlikely to be affected by adverse impacts of this nature considering that it is not within or linked to an AQMA or in close proximity to the strategic road network."*

2.5 In the updated 2024 draft Integrated Impact Assessment, it is stated that *"the majority of the seventeen employment sites are likely to result in adverse impacts in relation to air, water, noise or soil pollution. The exceptions to this being sites CE76 and RE29 which are not located by the strategic road network, linked to an AQMA or within a Source Protection Zone and does not contain higher value agricultural soils."*

2.6 It is further stated that *"ten of the employment sites considered are expected to have significant negative effects in terms of pollution of air, water or soils in the District. All but one of these sites have been identified as either being within or linked to an AQMA meaning there is potential for further*

[1] Integrated Impact Assessment: Cannock Chase Local Plan Preferred Options (cannockchasedc.gov.uk)

[2] Local Plan Reg 19 Integrated Impact Assessment inc SA & HIA 02.24 0.pdf (cannockchasedc.gov.uk)

impacts on air quality in these areas as a result of increases in traffic volumes associated with the new development. All of these employment sites (apart from CE18) are directly adjacent to or directly linked by road to the A5 which runs through the southern part of Cannock and Norton Canes and feeds into the M6 Toll motorway along which an AQMA has been declared."

2.7 However, Cannock Chase's own Air Quality Annual Status Report 2023[3] notes that:

"Air quality monitoring data collected during 2022 does not suggest that the annual air quality objective for NO_2 of 40µg/m^3 is being exceeded at any of the monitoring locations. Indeed, the data suggests that improvements to air quality following the reduction in road traffic between 2020-2022 (due to Covid-19) are being sustained.

It is appropriate to revoke AQMA 1 and AQMA 3 (revocation orders came into force on 1May 2023); additional monitoring is required in AQMA 2, although if current trends continue this may be considered for revocation.

Whilst the current Air Quality Action Plan is out of date, given the likelihood of AQMA 2 being revoked, such an update is not likely to be of any practical benefit at this time. Cannock Chase Council will therefore prioritise other actions in 2023."

2.8 Evidence of the pollution concentrations being below the air quality objective within AQMA 2 (closest to the Site) can be seen in its monitoring data, shown in Figure 2.

[3] Cannock Chase Council (2023) 2023 Air Quality Annual Status Report

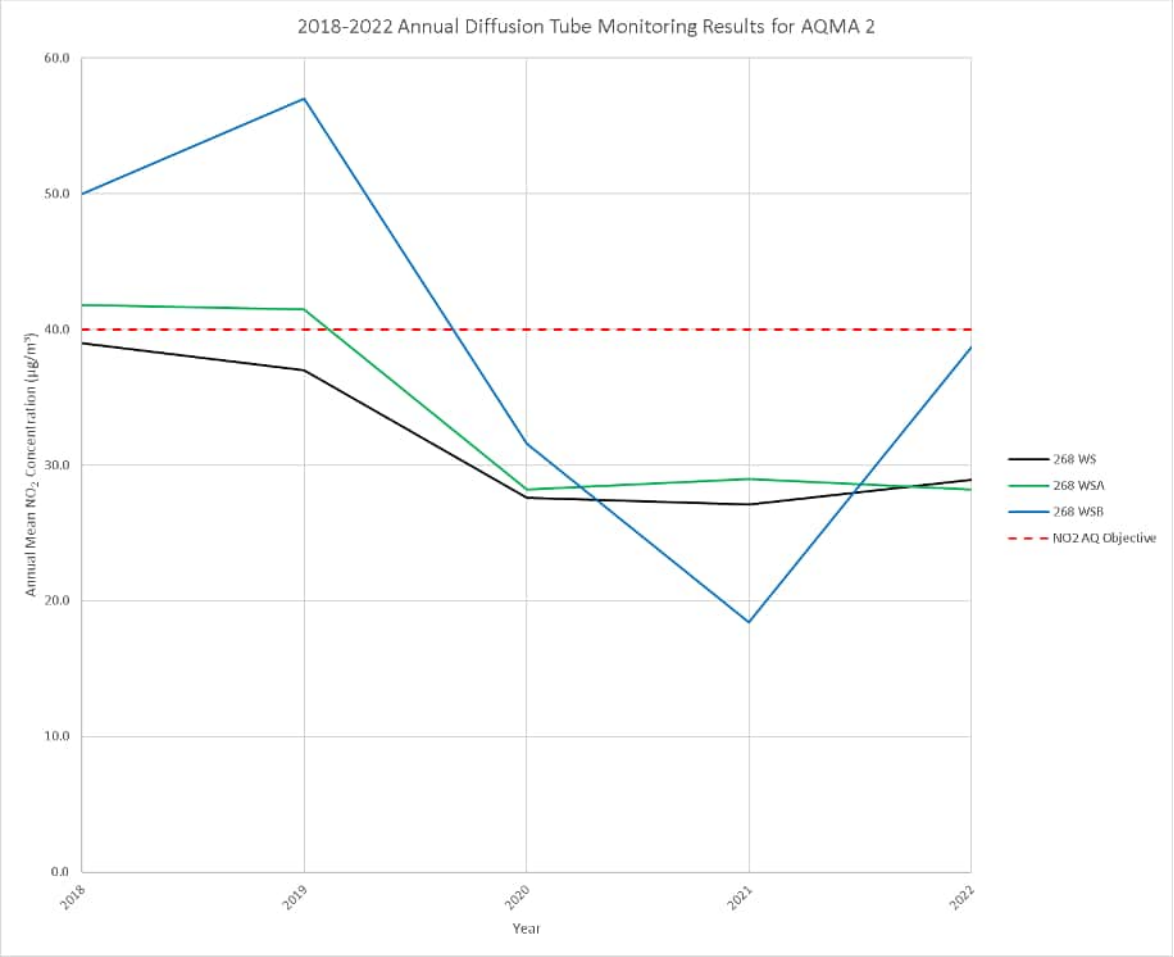

Figure 1: Monitoring Data Trend within Nearby AQMA 2[3]

2.9 As set out in Paragraph 2.1, it is unreasonable to determine the impact of development of a particular site upon air quality based purely on proximity to an AQMA. There are two reasons for this:

- The presence of an AQMA does not necessarily mean that the air quality objectives are being exceeded (as is the case within AQMA 2, near to the proposed Watling Street Business Park); and
- Concentrations are anticipated the reduce during the plan period.

2.10 Specifically, in relation to the Site's impact on the nearby AQMA, monitoring (268 WS) near to one of the few properties that could be most affected, indicates that the annual mean nitrogen dioxide objective has been achieved for a number of years.

2.11 A summary of the AQMAs in the vicinity of Watling Street Business Park is set out in Table 1 below. There are currently no AQMAs with relevant exposure where concentrations currently exceed the objective. Moreover, AQMAs 1 and 3 were both revoked in 2023 (although they have been included in the summary since they were still active in 2022) and, it is likely, that Cannock Chase's AQMA 2 will also be revoked during the plan period.

Table 1: List of AQMAs

Local Authority	AQMA	Annual Mean Nitrogen Dioxide Concentrations	Revoke/Retain
Cannock	AQMA 2 – A5 Watling St East (section closest to Business Park)	268 WS is the relevant tube = 28.9 µg/m^3 in 2022	Air quality in AQMA 2 meets the annual air quality objective; air quality monitoring data will be reviewed in the 2024 ASR and, if current trends continue, revocation will be considered.
Cannock	AQMA 1 – A5 Watling St West	54 WS is the relevant tube = 26.6 µg/m^3 in 2022	Formally revoked on 1 May 2023.
Cannock	AQMA 3 – Five Ways Island	HHFW is the relevant tube = 36.6µg/m^3 in 2022	Formally revoked on 1 May 2023.
Walsall	Whole borough	Exceedances only in centre of Walsall	Retain
South Staffordshire	AQMA No. 5 Oak Farm	25.6 µg/m^3 in 2022	This will remain in place for continued monitoring. The levels have dropped within the AQMA to below the objective; however, the longer-term implications of COVID-19 will be looked at.
Objective		**40 µg/m^3**	**-**

2.12 While all exceedances within the borough-wide Walsall AQMA are in the centre, away from the Site, due to the magnitude of traffic[4] predicted to enter the Walsall AQMA from the scheme being well above published industry screening thresholds[5], detailed modelling has been undertaken. Due to the reasons stated above, it is not considered necessary to model an extensive study area. Three worst-case receptor locations adjacent to the A5 (Watling Road) in the Walsall AQMA have been selected, with three additional receptors adjacent to the A5 AQMAs and Lime Lane included for completeness (see Figure 2). The receptor selection accounts for proximity to junctions, where traffic may become congested and where there is a combined effect of several road links.

2.13 Modelled concentrations are presented in Table 2 and Table 3 below; the impact descriptors are those provided in the IAQM guidance5 and are based on the change in concentrations as a result of the scheme in 2028. The impacts for nitrogen dioxide, PM_{10} and $PM_{2.5}$ are all negligible, with concentrations of each pollutant being well below the objectives. The effect of the scheme on human health is therefore judged to be 'not significant'.

[4] The impacts of the maximum trip generation for the site (assuming entirely 46,393 m^2 of B8 use) have been assessed; this is a worst-case approach.

[5] Moorcroft and Barrowcliffe et al (2017) Land-Use Planning & Development Control: Planning For Air Quality v1.2

Table 2: Modelled Nitrogen Dioxide Concentrations at Human Health Receptors

Receptor	Annual Mean Nitrogen Dioxide (µg/m^3)			
	Without Scheme	With Scheme	% Change [a]	Impact Descriptor
H1	15.3	15.7	1	Negligible
H2	16.7	17.2	1	Negligible
H3	12.6	12.8	1	Negligible
H4	12.1	12.2	0	Negligible
H5	18.0	18.1	0	Negligible
H6	15.8	16.2	1	Negligible
Objective	40 µg/m^3		-	

[a] Change as a % of the Air Quality Assessment Level (AQAL).

Table 3: Modelled PM_{10} and $PM_{2.5}$ Concentrations at Human Health Receptors

Receptor	Annual Mean PM_{10} (µg/m^3)				Annual Mean $PM_{2.5}$ (µg/m^3)			
	Without Scheme	With Scheme	% Change [a]	Impact Descriptor	Without Scheme	With Scheme	% Change [a]	Impact Descriptor
H1	14.8	14.9	0	Negligible	9.4	9.4	0	Negligible
H2	15.1	15.3	0	Negligible	9.5	9.6	0	Negligible
H3	13.1	13.1	0	Negligible	8.4	8.4	0	Negligible
H4	13.4	13.4	0	Negligible	8.3	8.4	0	Negligible
H5	15.2	15.2	0	Negligible	9.5	9.5	0	Negligible
H6	15.0	15.1	0	Negligible	9.5	9.5	0	Negligible
Objective	40		-		20 [b]		-	

[a] Change as a % of the Air Quality Assessment Level (AQAL).

[b] There is no numerical $PM_{2.5}$ objective for local authorities. Convention is to assess against the UK limit value which is currently 20 µg/m^3.

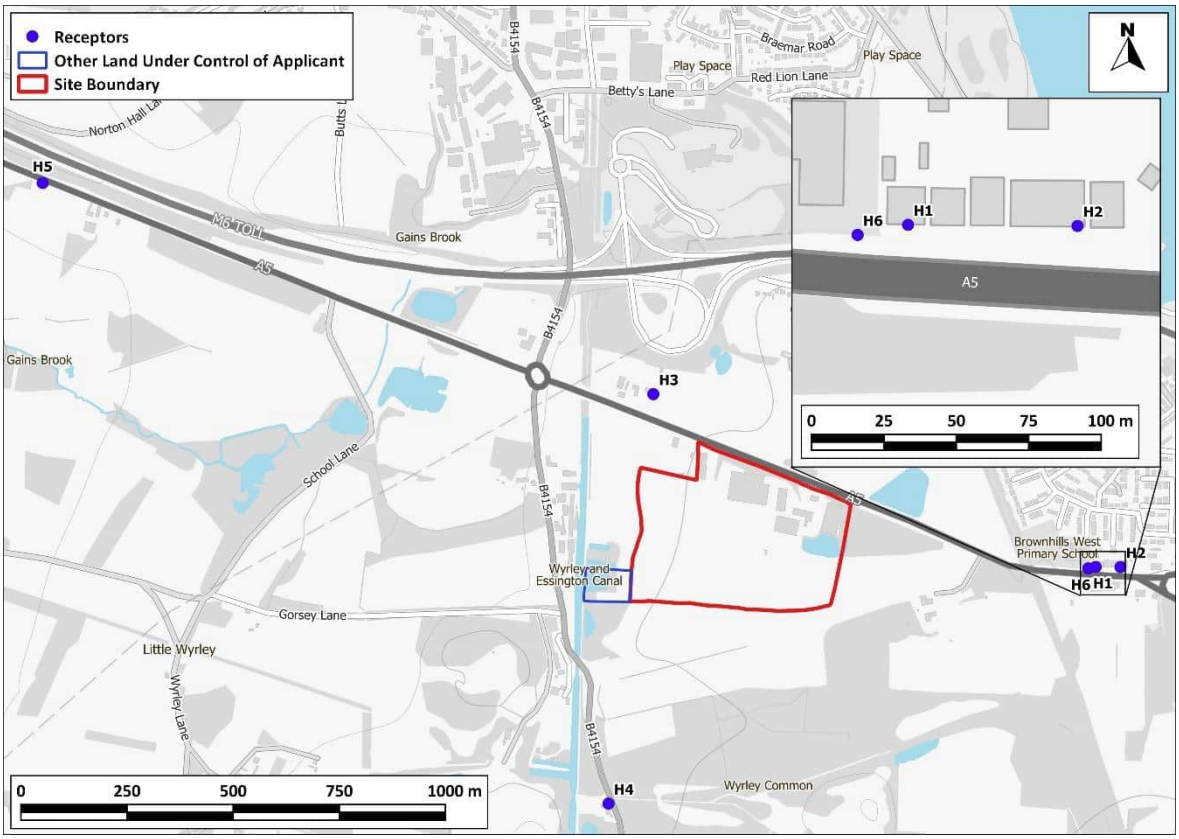

Figure 2: Human Health Receptor Locations

3 Ecology

3.1 The key site of concern is the Cannock Canal Extension SAC. The HRA Scoping Report identifies the qualifying feature as floating water plantain, luronium natans.

3.2 The screening criteria set out within the JNCC Guidance on Decision-making Thresholds for Air Pollution[6] are, if a plan or project would lead to a change in the Annual Average Daily Traffic (AADT) vehicle flow that exceeds 0.15% of the existing-year[7] AADT on that road within 200m of the SAC the air quality impacts should be assessed. The Site will exceed these screening criteria in isolation[8].

3.3 As a result, the increase in concentrations of nitrogen oxides and ammonia, and the influence of these changes upon nitrogen deposition (Ndep)[9], have been modelled to establish the impacts of the proposed increase in traffic on the nearby SAC, assuming an opening year of 2028. The impacts have been considered using a two-step approach: **Stage 1** considers the absolute change in concentrations as a result of the scheme, and **Stage 2** considers the in-combination change of the scheme, with generic traffic growth, relative to the future improvement offset. The improvement offset is also referred to as 'autonomous changes' and reflects the reduction in concentrations between the base and future years due to improved emissions standards and uptake of cleaner vehicles. At a different location Natural England have previously considered that a change due to the development in excess of 50% of the autonomous improvements was acceptable[10,11].

3.4 The traffic data provided shows an increase in vehicle traffic near the SAC on both the A5 and Lime Lane; the study area has therefore been restricted to these links.

Stage 1

3.5 In summary, the increase in development traffic is predicted to cause impacts of greater than 1% of the nutrient nitrogen deposition critical load at the nearby SAC, with impacts greater than 10% at the northern tip of the SAC, assuming a critical load of 2 kg/ha/yr. Impacts would be limited to no greater

[6] JNCC (2021) Guidance on Decision-making Thresholds for Air Pollution.

[7] The opening year of the development.

[8] The 2028 baseline flow being approximately 30,000 AADT, with predicted development site trip generation being approximately 3,200 AADT.

[9] While APIS indicates the site is sensitive to acid deposition, no critical loads are made available to assess against.

[10] Natural England (2019) European Site Conservation Objectives: Supplementary advice on conserving and restoring site features Ashdown Forest Special Area of Conservation (SAC) Site Code: UK0030080.

[11] In this case the development was predicted to remove 53% of the autonomous improvements, while the in-combination impact was predicted to remove 74% of the autonomous improvements. As documented in the executive summary of the air quality modelling report cited by Natural England (2019) which shows the maximum deposition to heath predicted using the most detailed modelling would fall from 22.7 kgN/ha/yr in 2015 to: 19.3 kgN/ha/yr in 2028 without any 'in-combination' traffic; 20.8 kgN/ha/yr in 2028 without the Submission Plan, and 21.8 kgN/ha/yr with the Plan.

than 5% if the critical load was designated as 10 kg/ha/yr, although the area of exceedance would be a lot smaller. Figure 3 and Figure 4 below show the increase in modelled nutrient nitrogen deposition at the A5 (Watling Road) and Lime Lane, as a percentage of the 2 kg/ha/yr and 10 kg/ha/yr Critical Load criteria.

3.6 There are also predicted to be impacts greater than 1% of the NOx annual mean critical level of 30 µg/m^3 at the northern tip of the SAC near the A5, but not near Lime Lane. There are predicted to be impacts greater than 1% of the ammonia critical level of 3 µg/m^3 at the SAC near Lime Lane and the northern tip of the SAC, near the A5. Impacts greater than 10% of the 24-hour NOx critical level would not occur, regardless of which 24-hour NOx critical level is assumed (either 75 µg/m^3 or 200 µg/m^3).

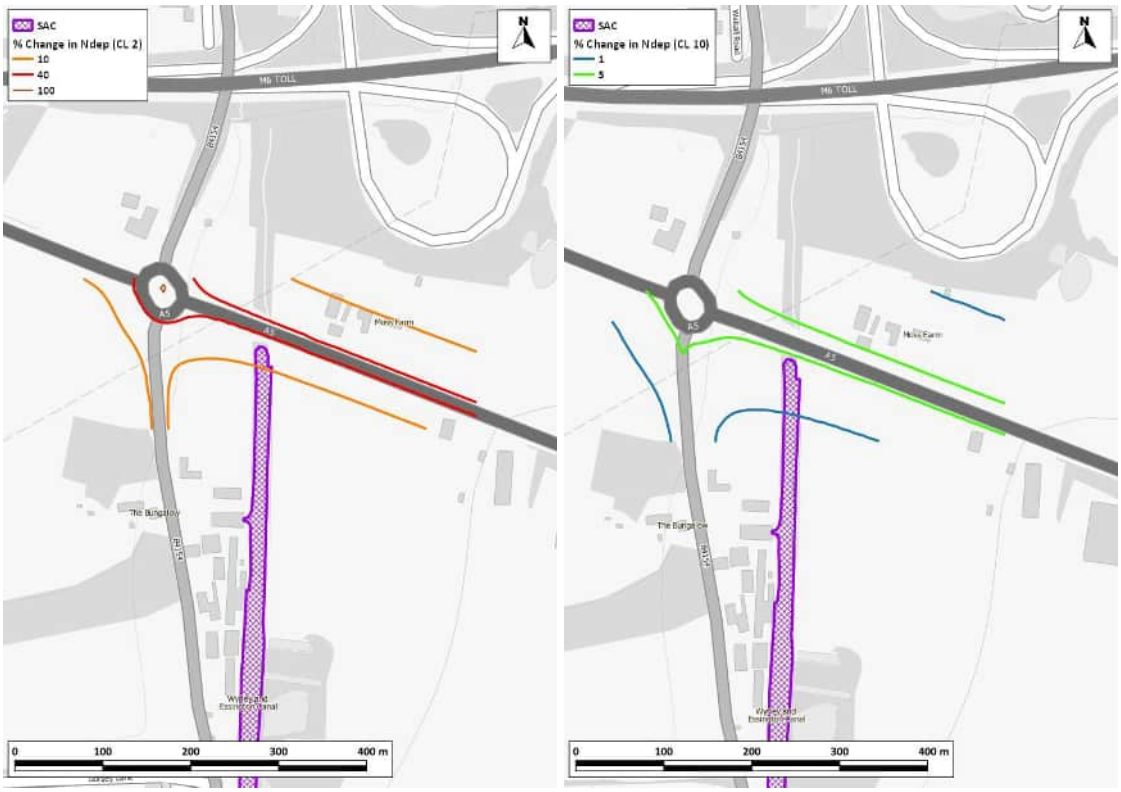

Figure 3: Increase in Modelled Nutrient Nitrogen Deposition at A5 (Watling Road)

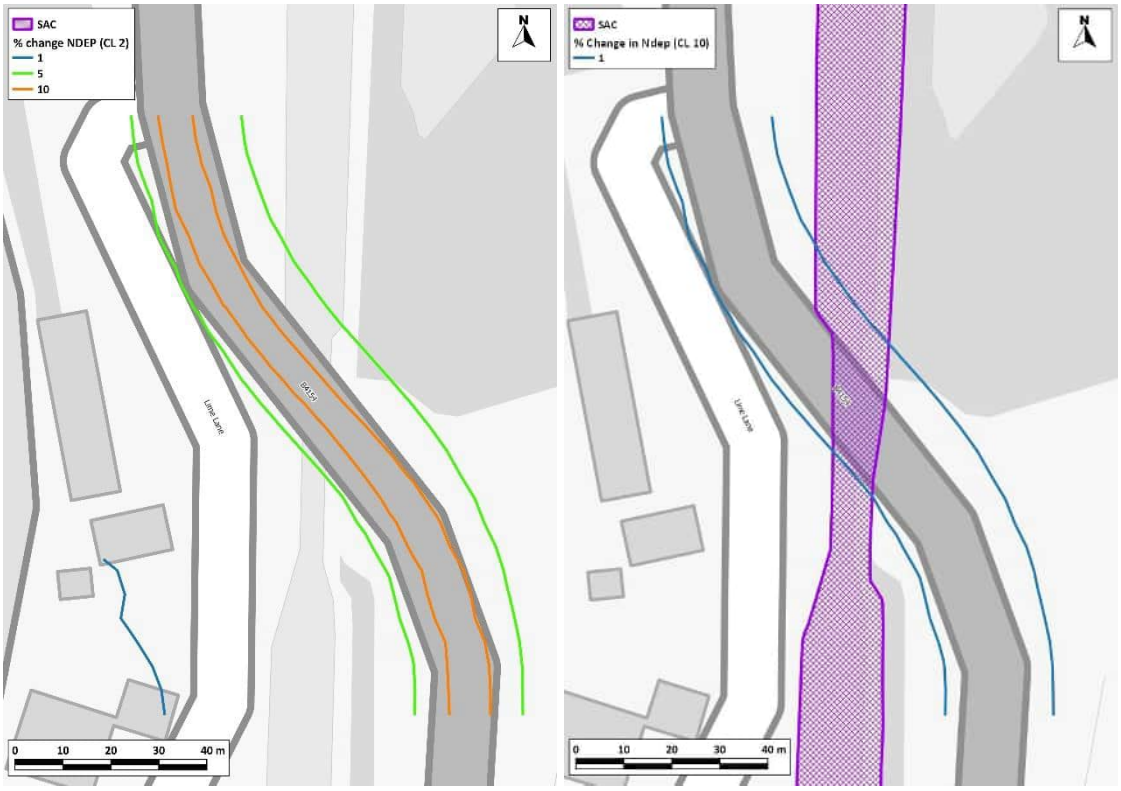

Figure 4: Increase in Modelled Nutrient Nitrogen Deposition at Lime Lane

Stage 2

3.7 Adjacent to the A5, there is small area at the northern tip of the SAC (135 m^2) where in-combination changes in modelled nutrient nitrogen deposition are greater than 50% of the autonomous reductions. In addition, a small portion (260 m^2) of the SAC directly adjacent to Lime Lane will see an in-combination increase of >50%. Results also show that the combined impact of the development and generic traffic growth would offset more than 50% of the improvement caused by advancing technology for ammonia at approximately 9 m^2 of the northern tip of the SAC (see Figure 6).

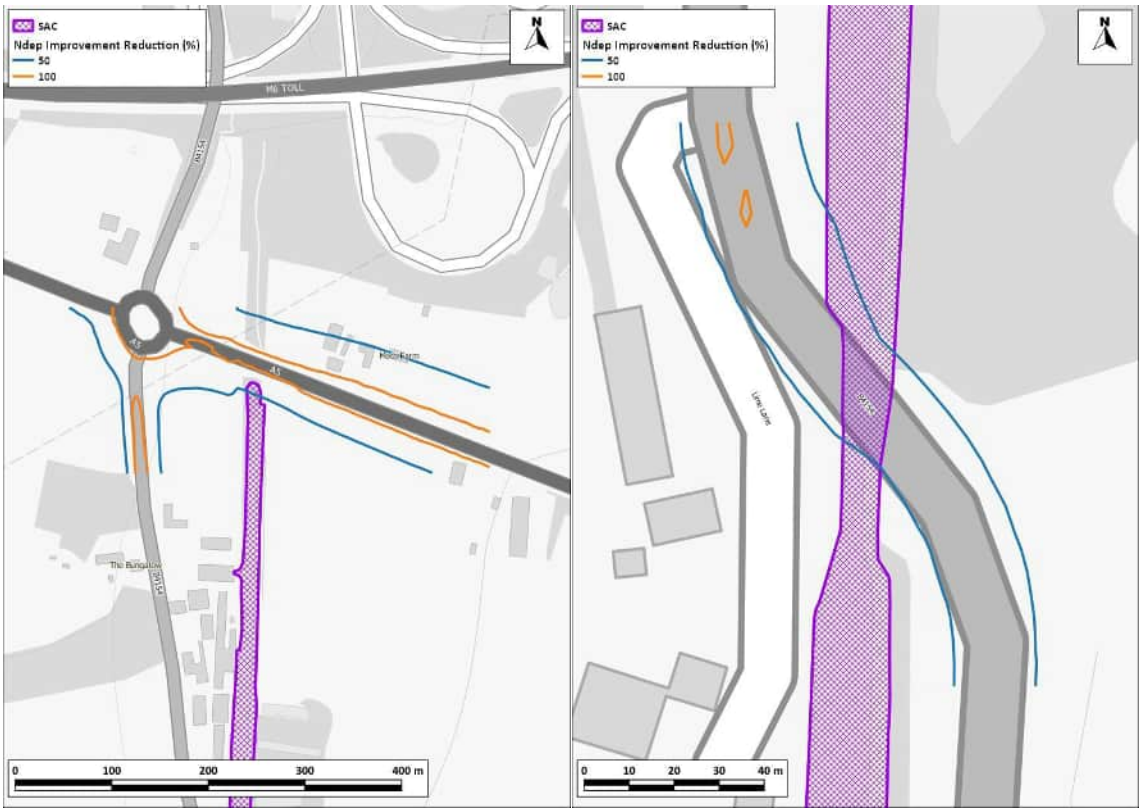

Figure 5: Nutrient Nitrogen Deposition Improvement Reduction (%)

Figure 6: Ammonia Improvement Reduction (%)

3.8 The combined impact of the Watling Street development and generic traffic growth will not be greater than the future improvement offset at any location within the SAC.

4 Summary

4.1 The development is close to an AQMA (AQMA 2) declared by Cannock Chase District Council and the borough-wide Walsall AQMA; however, this does not mean that the air quality objectives are currently being exceeded along its entire length, nor that this will continue to be the case throughout the lifetime of the plan. Due to the magnitude of traffic predicted to enter the Walsall AQMA, where there are a number of receptors, dispersion modelling of the traffic impacts has been undertaken. The predicted concentrations at worst case receptors do not exceed any of the objectives at any location, and development traffic impacts are predicted to be negligible. The development is, therefore, not expected to have a significant effect at any existing, sensitive receptor with regards to human health.

4.2 Modelled impacts of the development, in-isolation, at the Cannock Canal Extension SAC show an increase greater than 1% of the critical level/load of NOx, NH_3 and nitrogen deposition within areas of the SAC boundary adjacent to both the A5 and Lime Lane (the exception being for the NOx critical level near Lime Lane).

4.3 The combined impact of the development and generic traffic growth will not be greater than 50% of the future improvement offset, with the exception being for nitrogen deposition and ammonia at small portions of the SAC. However, the combined impact will not exceed the future improvement offset in any locations within the SAC.