

Assesment of Impact as a % of Critical Load**HORSELL COMMON**

Estimated Worst Case Background 2020	Critical Load*	Worst case process	PEC	PEC as % of Critical load	
10.78	10	0.03	10.81	108	
10.78	20	0.03	10.81	54	

IS IMPACT LESS THAN 1% OF CRITICAL LOAD?

Where critical load is taken as

10	0.271	NO
20	0.135	YES

IS PEC LESS THAN 70% OF CRITICAL LOAD?

10	108	NO
20	54	YES

***CRITICAL LOADS**

APIS 2011	kg N ha-1 y-1
Northern Atlantic wet Heaths with Erica tetralix	10 - 20

APIS 2011

	kg N ha-1 y-1
WOODLARK NIGHTJAR AND DARTFORD WARBLER	10 - 20

Assesment of Impact as a % of Critical Load**HORSELL COMMON**

Distance (m)	Estimated Worst Case Background 2020	Critical Load*	Worst case process	PEC	PEC as % of Critical load	
5	10.78	10	0.03	10.81	108	
10	10.78	10	0.02	10.80	108	
50	10.78	10	0.01	10.79	108	
100	10.78	10	0.00	10.78	108	

IS IMPACT LESS THAN 1% OF CRITICAL LOAD?

Where critical load is taken as

5	10	0.271	NO
10	10	0.250	NO
50	10	0.104	NO
100	10	0.034	YES

Distance Regression (Exponential)

DISTANCE	EXPONENTIAL
50	0.1024
55	0.0918
100	0.0341

CRITICAL LOADS*APIS 2011**Northern Atlantic wet Heaths
with Erica tetralix**kg N ha-1 y-1**

10 - 20

APIS 2011WOODLARK NIGHTJAR AND
DARTFORD WARBLER**kg N ha-1 y-1**

10 - 20

DMRB Volume 11 Section 3 Part 1 HA 207/07

Assessment of Designated Sites Annex F

1. Identify Sensitive Site

Is the site sensitive to N deposition?

Horsell Common SPA (within 200m of A320/A245)

Part of Thames Basin Heaths

SPA due to three bird species - See APIS

All sensitive to Nitrogen - See APIS

2. Obtain total average N deposition for 5km grid square

See APIS

Horsell Common SPA - Location for SSSI unit 4* - TQ11606

TQ11606 - www.gridreferencefinder.com - 501 100, 160, 600

NB - Location ~350m from A320/A245 roundabout

www.apis.ac.uk - search database by habitat or species - Site Relevant Critical Loads

Therefore:

Species	2005 N deposition (kg/ha/yr)	2020 N deposition (kg/ha/yr)
Woodlark	16.24	10.78
Nightjar	16.24	10.78
Dartford Warbler	16.24	10.78

TYPICAL N DEPOSTION FOR CALCULATION

10.78

*www.english-nature.org.uk

SSSI Horsell Common	2005 N deposition (kg/ha/yr)	2020 N deposition (kg/ha/yr)
Northern Atlantic wet Heaths with Erica tetralix	15.893	10.08

3. Obtain NO2 and NOX background

Air Quality Archive - <http://uk-air.defra.gov.uk/>

Local Air quality Managment (LAQM) - Tools for LAQM - Background Maps - Nox NO2 etc 2008 background maps - download CSV 2008 2020 background maps

Select Authority - Select Pollutants (NO2 -Nox) - Select year (2010) - Get data - save

Locate grid ref (see previous sheet)

Therefore:

Closest Grid ref to 501100, 160600

Grid Ref chosen	NO2 2020	NOX 2020
500500, 161500*	8.19	10.87

*NB this location is approx 1.2km from roadside. Guidance recommends background is taken from up to 4km away so that road contrib is not Double Counted. Road contribution to Nox is calculated here as at ~1.65 ug/m3

4. Calculate the NO2 Concentration in transect near the road

See typical DMRB screening

Most App Background for Horsell Common 2020 (Only Available to 2020)

Nox	NO2	
500500, 161500	10.87	8.19

With out dev flows A With Dev (scenario D) flows A245			WITH MINUS WITHOUT	% HGV without	with	Speed (Kph) without	with
15824	16771		947	4	4	62	59
				TYPICAL	4	AVERAGE	60.5
SPEED REDUCTION SIGNIFICANTLY SQUEWS RESULTS RUN AGAIN							
With out dev flows A With Dev (scenario D) flows A320			WITH MINUS WITHOUT	% HGV without	with	Speed (kph) without	with
27440	32703		5263	5	4	65	59
				TYPICAL	4	AVERAGE	62

Receptor number	Name	Year	NO _x	NO ₂ *	WORST CASE PC
			Annual mean µg/m ³	Annual mean	
1	Horsell Common A245 without	2025	21.99	11.73	
2	Horsell Common A245 with	2025	22.25	11.81	0.07
3	Horsell Common A320 without	2025	24.74	12.49	
4	Horsell Common A320 with	2025	25.74	12.76	0.27

See traffic analysis for derivation of AADF

See NO2 from Road check sheet for identification of outlier attributes

NB IS ASSUMED THAT NEGATIVE PROCESS CONTRIBUTION IS A FACTOR OF THE REDUCTION IN SPEED WITHIN THE DMRB CALCS.

NB IS 'WITH MINUS WITHOUT' GREATER THAN 1000? FURTHER ANALYSIS REQUIRED

5. Estimate the dry deposition of NO2 in a transect near the road

Distance from Road	NO2 2020	N deposition 2020*
--------------------	----------	--------------------

5m	0.27	0.027
10m	0.25	0.025
50m	0.10	0.010
100m	0.03	0.003

* As per EMEP Eulerian photochemistry model see Annex F

**USING RELATIONSHIP DERIVED FROM AEA REPORT TO PUSH I i.e. Reduction of 44%

6. Determine the road increment to NO2 dry deposition

Step 6 not clear. Therefore :

APIS Background N for this location in 2020	10.78
Calculated 'process contribution' N deposition for this location at 5m*	0.027
Calculated 'process contribution' N deposition for this location at 10m*	0.025
Calculated 'process contribution' N deposition for this location at 50m *	0.010
Calculated 'process contribution' N deposition for this location at 100m*	0.003

* Based upon Annex F instructions