

A417 Missing Link
TR010056

6.4 Environmental Statement
Appendix 5.5 Air quality sites
used for verification

Planning Act 2008

APFP Regulation 5(2)(a)
Infrastructure Planning (Applications: Prescribed Forms and
Procedure) Regulations 2009

Volume 6

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Infrastructure Planning

Planning Act 2008

**The Infrastructure Planning
(Applications: Prescribed Forms
and Procedure) Regulations 2009**

A417 Missing Link

Development Consent Order 202[x]

**6.4 Environmental Statement
Appendix 5.5 Air quality sites used for verification**

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Planning Inspectorate Scheme Reference	TR010056
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Table of Contents

	Pages
1 Air quality sites used for verification	i
1.1 Sites used for verification	i

Table of Graphs

Graph 1-1	A417 model performance	iv
Graph 1-2	M5 model performance (no adjustment required)	v

Table of Tables

Table 1-1	Monitoring sites removed from the verification process	ii
Table 1-2	Model performance	iii

1 Air quality sites used for verification

1.1 Sites used for verification

- 1.1.1 Verification has been completed using 31 monitoring sites across the study area. Where appropriate, the locations of the monitoring sites were updated following the site visit and location reviews.
- 1.1.2 Verification followed the methodology outlined in the Local Air Quality Management Technical Guidance (LAQM TG.16)¹. The following method has been used:
- comparison of the modelled road NO_x versus the monitored road NO_x. Road NO_x measured at the diffusion tube monitoring sites was calculated using the latest Department for Environment, Food & Rural Affairs (Defra) NO_x to NO₂ calculator², available on the Local Air Quality Management (LAQM) website;
 - a verification factor was calculated based on the regression equation and this was applied to the modelled road NO_x concentrations; and
 - the adjusted modelled road NO_x contribution was then used to calculate the total NO₂ using the Defra NO_x to NO₂ calculator².
- 1.1.3 The air quality monitoring data collected as part of this assessment was reviewed to determine the suitability of each of the monitoring locations for inclusion in the model verification process. The criteria used to determine the suitability of the monitoring data for inclusion into the verification process is outlined below:
- monitoring location was required to be within 200m of a road within the study area;
 - monitoring data in 2016 was required to have a data capture of ≥75%;
 - monitoring data influenced by major road emissions sources which were missing from the traffic model, and hence could not be included in the dispersion model was excluded; and
 - monitoring data from sites where the exact location could not be accurately identified or validated was excluded.
- 1.1.4 Twelve monitoring sites were not used in the verification process, and the reasons are detailed in Table 1-1.
- 1.1.5 Table 1-2 provides the verification details. Graphs showing the model performance are shown in Graph 1-1 and Graph 1-2 of this appendix.

¹ Department for Environment Food & Rural Affairs, "Local Air Quality Management Technical Guidance (TG16)," 2018.

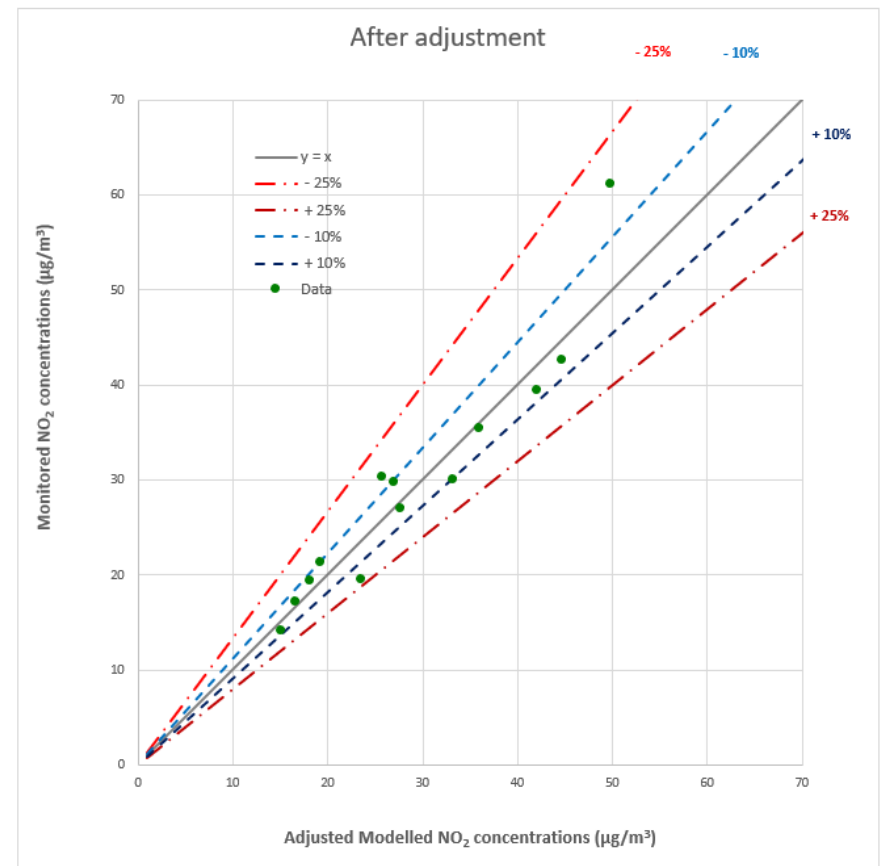
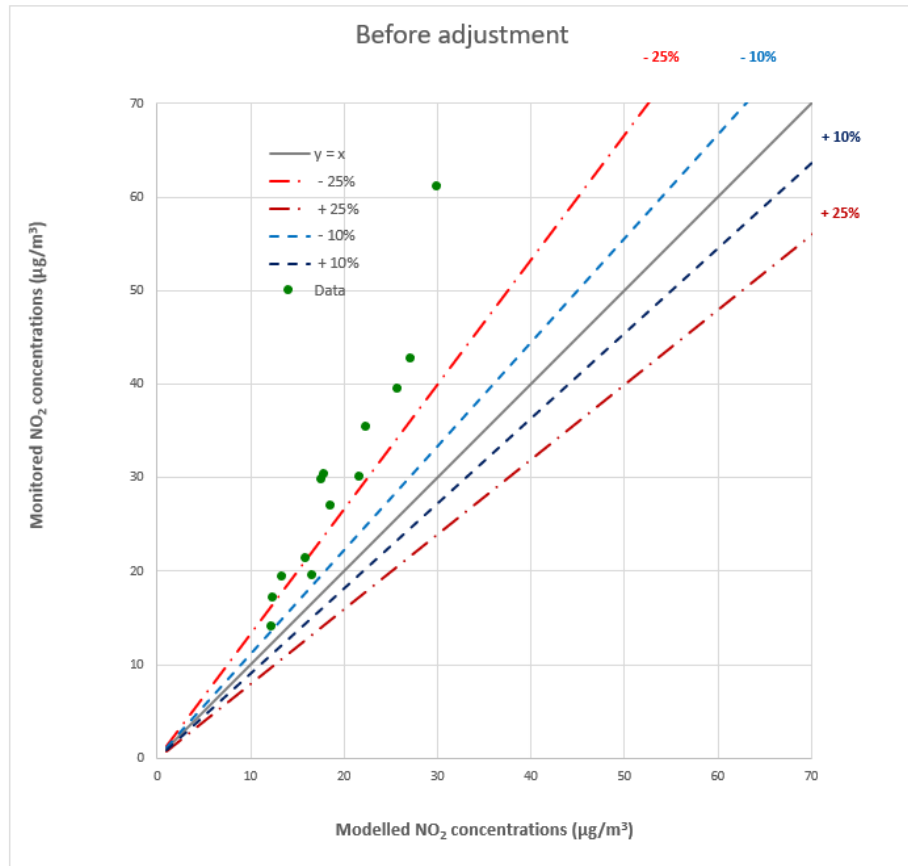
² Defra, "Defra LAQM website NO_x to NO₂," 2017. [Online]. Available: <http://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html#NOxNO2calc>. [Accessed July 2020]

Table 1-1 Monitoring sites removed from the verification process

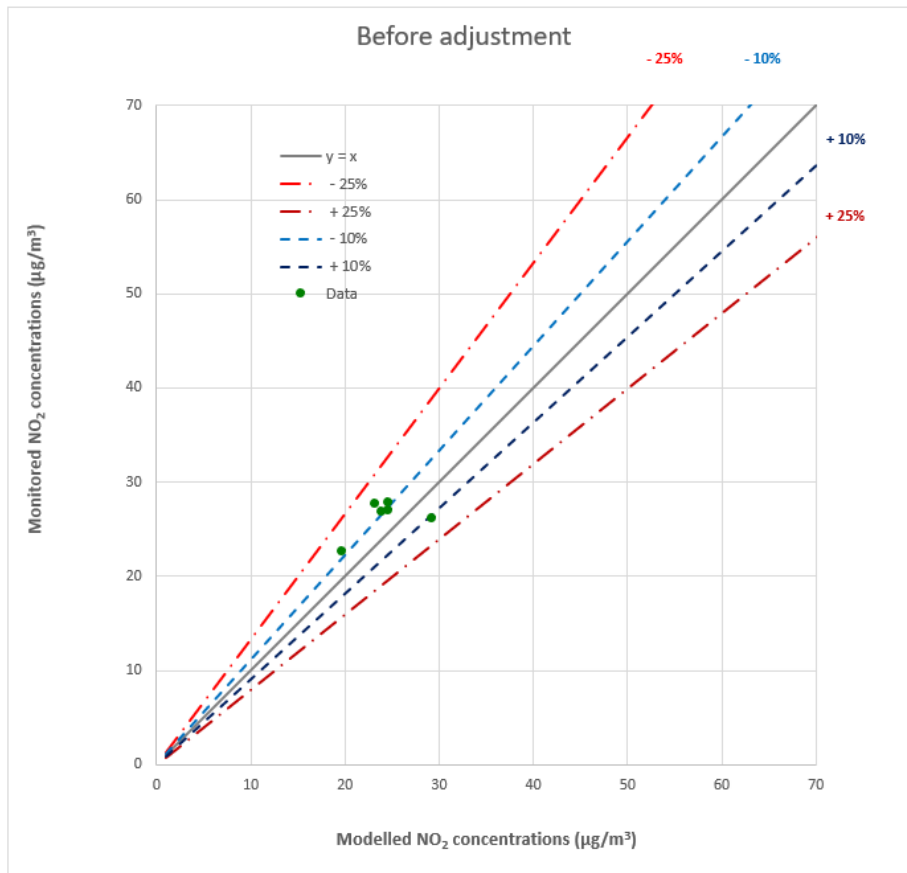
Site ID	Location	Reason
18	81 London Road, Cheltenham	No modelled roads adjacent to monitor.
T13	Air Balloon Roundabout, A417	Located on the same lamppost as T12. Average concentration used.
T16	Stow Lodge, Cirencester	Road opposite monitor not modelled.
14N	Sussex gardens, Hucclecote	Location could not be determined.
15N	M5, Bamfurlong	Location could not be determined.
16N	Withybridge Gardens	No modelled roads adjacent to monitor.
54N	Stocken Close, Hucclecote	Location could not be determined.
A417AB_001_1215	A417, Birdlip	No modelled roads adjacent to monitor.
A417AB_002_1215	Unnamed road near A417, Birdlip	No modelled roads adjacent to monitor.
A417AB_009_1215	Shurdington Road, Brockworth	No modelled roads adjacent to monitor.
A417AB_014_1215	Churchdown Lane, Hucclecote	No modelled roads adjacent to monitor.
A417AB_020_1215	Mill Lane, Brockworth	No modelled roads adjacent to monitor.

Table 1-2 Model performance

A417		M5	
Adjustment factor –	2.126	Adjustment factor –	1
Within +10%	5	Within +10%	0
Within -10%	4	Within -10%	1
Within +/-10%	9	Within +/-10%	1
Within +10 to 25%	2	Within +10 to 25%	0
Within -10 to 25%	2	Within -10 to 25%	4
Within +/-10 to 25%	4	Within +/-10 to 25%	4
Over +25%	0	Over +25%	0
Under -25%	0	Under -25%	1
Greater +/-25%	0	Greater +/-25%	1
Within +/-25%	13	Within +/-25%	5
Total	13	Total	6
Uncertainties assessment		Uncertainties assessment	
Correlation	0.95	Correlation	0.52
RMSE ($\mu\text{g}/\text{m}^3$)	3.96	RMSE ($\mu\text{g}/\text{m}^3$)	3.27
Fractional bias	0.03	Fractional bias	0.09



Graph 1-1 A417 model performance



Graph 1-2 M5 model performance (no adjustment required)