
Project:	Capitol Park, Barnsley: Air Quality Assessment	Job No:	60501921
Subject:	Air Quality Technical Note	Date:	13th September 2016

Introduction

In June 2016 an air quality assessment was undertaken to determine the local air quality impacts associated with a proposed development consisting of industrial and office units, alongside car parking for approximately 300 vehicles on undeveloped land on Capitol Close, Barnsley. The report, 'Capitol Park, Barnsley: Air Quality Assessment' (AECOM, 2016) was submitted as part of an outline planning application.

On 9th September 2016, an e-mail was received from Chris Shields, Technical Officer at Barnsley Metropolitan Borough Council, who provided the following comments in relation to the monitoring data presented in the report and requested that pollutant concentrations and impacts be predicted at additional receptors adjacent to the eastbound carriageway of Dodsworth Road. This Technical Note addresses these comments.

Monitoring

Chris Shields provided the following comment with regards to the annual mean NO₂ concentrations recorded at the council monitoring sites and reported in Table 8 of the report 'Capitol Park, Barnsley: Air Quality Assessment' (AECOM, 2016).

'The reports' table 8: Passive Monitoring NO₂, details the annual mean concentrations for 2012 to 2015 in µg/m³. I note from this table that you have quoted the distance corrected (to receptor façade) data for years 2012-2014 inclusive, whilst 2015 data has not been distance corrected (representing kerbside / roadside locations). Use of 2015 kerbside / roadside data, in comparison to 2012 – 2014 distance corrected data may have implications for model verification and future forecast concentrations in your report? Have you any comments regarding this?'

Table 8 of the report has been amended (see Table 1 below) to include the distance corrected annual mean NO₂ concentrations for 2012 to 2015. For 2015 uncorrected (for distance to the facade) annual mean NO₂ concentrations have also been provided as these concentrations were used for model verification purposes.

Table 1: Passive Monitoring, NO₂ Concentrations (replaces Table 8 of the report)

Location		Classification	Within AQMA?	Annual Mean NO ₂ (µg/m ³) (distance corrected to the façade, except for the values in parentheses)			
				2012	2013	2014	2015
20	Dodworth Road, SE of Pogmoor Crossroads	Roadside	Yes	36.9	34.9	37.3	36.3 (49.3)
73	Pogmoor Crossroads	Roadside	Yes	41.7	39.2	40.7	39.5
74	Pogmoor Crossroads	Roadside	Yes	43.0	41.0	39.9	37.1
75	Pogmoor Crossroads	Roadside	Yes	41.7	40.4	40.6	39.2
76	249 Dodworth Rd West Crossroads	Roadside	Yes	41.4	38.4	40.0	38.2 (44.4)
77	Post Office, Crown Hill Road	Roadside	Yes	34.3	30.8	34.1	30.9
78	305 Dodworth Road	Roadside	Yes	47.1	42.2	45.9	44.8 (58.1)
79	315 Dodworth Road	Kerbside	Yes	43.0	40.8	41.7	40.1 (53.2)
80	329 Dodworth Road	Roadside	Yes	42.3	39.9	39.1	38.2 (44.5)
81	M1 Junction 37	Roadside	Yes	32.1	30.2	31.2	-
82	30 Barnsley Road	Roadside	No	31.2	28.9	31.0	-
85	Woodbine Cottages, Barnsley Road	Roadside	No	34.1	32.2	34.1	-
98	Dodworth Road, Pogmoor	Roadside	Yes	41.0	37.5	38.2	34.4 (44.7)

Generally annual mean NO₂ concentrations have experienced a slight decrease between 2012 and 2015. In 2015, only two sites recorded an exceedance of the objective compared to five sites in 2014 and four sites in 2013. All these sites are located on Dodworth Road and within the AQMA.

The highest concentrations in 2015 were recorded at Sites 78 and 79 located on Dodworth Road; however annual mean NO₂ concentrations have decreased slightly since 2012 at both these sites.

Monitoring ceased at Sites 81, 82 and 85 in 2014 due to continued annual mean NO₂ concentrations recorded below the objective.

Model Verification

The model verification procedure described in Section 3 and Appendix F of the report remains unchanged. The verification procedure was undertaken by comparing the modelled results and monitored concentrations at the council monitoring sites in 2015. The uncorrected (for distance) annual mean NO₂ concentrations were used in the verification procedure.

Modelled Receptors

Chris Shields provides the following comments with regards to the modelled sensitive receptors:

'I note from Appendix D: Location of Modelled Sensitive Receptors, that, for the A628 Dodworth Road link between M1 Junction 37 and Pogmoor Crossroads, you have chosen 2 receptor locations (locations 3 and 4 on the map within Appendix D), which appear to be adjacent to the westbound carriageway. From the diffusion tube data, the highest roadside concentrations between M1 Junction 37 and Pogmoor Crossroads appear to be at receptors adjacent to the eastbound carriageway. Therefore, would it be possible to provide data and assessment of significance for three receptors adjacent to the

eastbound carriageway (at least one of the receptors shall be close / at to 305-315 Dodworth Road where concentrations are highest)?'

As requested, additional receptors were selected adjacent to the eastbound carriageway of Dodsworth Road and pollutant concentrations were predicted for each of the scenarios described in Section 3.3 of the report.

Receptors

The following four receptors were selected at which pollutant concentrations were modelled, following the operational phase methodology outlined in Section 3.3 of the report 'Capitol Park, Barnsley: Air Quality Assessment' (AECOM, 2016).

Receptors 8, 9 and 10 are located at the façade of properties adjacent to Barnsley Metropolitan Borough Council diffusion tubes D80, D78 and D79, while Receptor 11 is located at the façade of a property near the Pogmoor/Dodworth road crossroads. The locations of these receptors are illustrated in Figure 1.

Table 2: Additional Modelled Receptors

ID	Location	Height (m)	X	Y
8	Dodworth Road, at property façade adjacent to D80	1.5	432281	405960
9	Dodworth Road, at property façade adjacent to D79	1.5	432342	405992
10	Dodworth Road, at property façade adjacent to D78	1.5	432397	406021
11	Dodworth Road, adjacent to Pogmoor Road	1.5	432638	406151

This drawing is to be used only for the purpose of showing that it was issued for and is subject to amendment.

LEGEND

- Modelled Sensitive Receptors
- Approximate Red Line Boundary

Map Labels: Side Farm, Lane Head Farm, Capitol Park, Capitol Court, Hunters Cottages, Hunters Cottage Farm, Junction 37, Ppg Sta, Recn Gd, Dodworth, Sch, Pav, Sports Field, Depot, Thornley, Barnsley Road, Gate Crescent, South Road, William Grove, Ure Cl, Moor Road, White Mill Avenue, Dodworth Road, Harewood Ave, Beaumont Ave, Moorland Avenue, Woodland Drive, Broadway, Horswood Cl, Arcliffe Drive, Hunter & Avenue, Moor Crescent, Midhope Way, Crowden W, Ewden Way, Hunters Rise, Cl.

Map Features: The map shows a red line boundary enclosing the proposed industrial estate. Sensitive receptors are marked with blue dots and numbered 1 through 11. The map also shows various roads, including Dodworth Road, Barnsley Road, and Gate Crescent. Landmarks such as Capitol Park, Hunters Cottage Farm, and a school are also indicated.

Scale: 0 to 375 m

North Arrow: N

Map Information:

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Version of Issue: FINAL

Client: MARSHALL COMMERCIAL DEVELOPMENT PROJECTS

Project Title: PROPOSED INDUSTRIAL ESTATE, CAPITOL PARK BARNSELY: AIR QUALITY ASSESSMENT

Drawing Title: LOCATION OF MODELLED SENSITIVE RECEPTORS

Drawn: RP, Checked: DU, Approved: TS, Date: 26/05/2017

Project No: 60501921, Scale: 1:4,000

AECOM

Results

The air quality assessment methodology described in Section 3.3 of the report 'Capitol Park, Barnsley: Air Quality Assessment' (AECOM, 2016) has been undertaken to predict concentrations of road transport derived pollutants, NO₂, PM₁₀ and PM_{2.5}, at the four additional sensitive receptors.

Nitrogen Dioxide

Annual mean concentrations of NO₂ were predicted at the four additional selected receptor locations. The results are presented below. The impact of the development is presented as the magnitude of change as a proportion of the objective (% impact). The description of the impact at each receptor takes into consideration this predicted change in concentration in the context of the total concentration and its relationship with the objective (refer to Table 5 of the report).

Table 3: Predicted Annual Mean NO₂ Concentrations (µg/m³)

ID	2015	2021			Impact	
		Base	Base + Committed Development	Base + Committed Development + Development	Development Impact	Cumulative Impact
8	46.1	48.1	48.5	48.9	0.3	0.8
9	39.6	41.0	41.4	41.7	0.3	0.7
10	37.5	38.8	39.2	39.4	0.2	0.6
11	38.8	40.1	40.6	40.9	0.3	0.8

According to Table 3, the highest annual mean NO₂ concentration was predicted to be experienced at Receptor 8, located on Dodworth Road, at the façade of the property adjacent to council monitoring site D80. A concentration of 48.9 µg/m³ was predicted at this receptor in 2021 with the committed development and the assessed development operational. However it is important to note that distance corrected façade concentrations at D80 have not exceeded 40 µg/m³ for the past three years and therefore it should be concluded that the model has significantly over-predicted concentrations at Receptor 8. Marginal exceedences of the annual mean NO₂ objective were predicted at Receptors 9 and 11 in all 2021 scenarios.

The results indicated that when considering the impacts of the development only, detrimental impacts were predicted at all four modelled receptors. Detrimental impacts of 0.3 or 0.2 µg/m³ were predicted at all four receptors due to the proposed development (i.e. excluding the committed development).

With reference to Table 5 of the report, the impact was considered to be Moderate Adverse at Receptors 8 and 9 due to the high absolute concentrations predicted by the model. However, it should be noted that an absolute concentration of <41 µg/m³ in the future assessment year, with an impact of 0.3 µg/m³ would have resulted in an impact of slight adverse. Taking into consideration the cautious model approach with regards to exhaust emission rates and background concentrations, it is considered likely that the 2021 annual mean NO₂ concentration at Receptor 9 would be < 41 µg/m³ (rather than just above) and therefore the impact should be considered slight adverse. Slight Adverse impacts were also predicted at Receptors 10 and 11.

In accordance with the EPUK/IAQM (2015) guidance, the impact of the development as well as committed developments (i.e. the cumulative impact) was considered. The largest cumulative impact of 0.8 µg/m³ was predicted to be experienced at Receptors 8 and 11. The main reason for these relatively high increases in concentrations is due to the residential development which has been granted planning permission on Broadway. This development will increase the number of vehicle movements on Broadway and Dodworth Road. The impact was described as Substantial Adverse at Receptor 8 and Moderate Adverse at Receptors 9, 10 and 11.

Overall, the impact of the development is considered to be **Not Significant** as all receptors were predicted to experience impacts best described as slight adverse (for the two receptors where Moderate adverse impacts were predicted it is considered that the model over predicted concentrations in 2021, and these impacts should instead be described as slight adverse.)

PM₁₀

Annual mean concentrations of PM₁₀ were predicted at the four receptor locations, with the results presented below. The impact of the development is presented as the magnitude of change as a proportion of the objective (% impact). The description of the impact at each receptor takes into consideration this predicted change in concentration in the context of the total concentration and its relationship with the objective (refer to Table 5 of the report).

Table 4: Predicted Annual Mean PM₁₀ Concentrations (µg/m³)

ID	2015	2021			Impact	
		Base	Base + Committed Development	Base + Committed Development + Development	Development Impact	Cumulative Impact
1	18.3	18.6	18.7	18.7	0.0	0.1
2	17.7	17.9	17.9	18.0	0.0	0.1
3	17.4	17.6	17.7	17.7	0.0	0.1
4	17.4	17.5	17.6	17.6	0.0	0.1

The highest annual mean PM₁₀ concentration was predicted to be experienced at Receptor 8, located on Dodworth Road, at the façade of the property adjacent to the Council monitoring site D80. A concentration of 18.7 µg/m³ was predicted at this receptor in 2021 with the committed development and the assessed development operational. Annual mean PM₁₀ concentrations were below the objective in all scenarios at all modelled receptors

The results indicated that when considering the impacts of the development only, detrimental impacts were predicted at all modelled receptors. The impact at all receptors was described as Negligible. In accordance with the EPUK/IAQM (2015) guidance, the impact of the development as well as committed developments was considered. The impact at all modelled receptors was described as Negligible.

Based on the above results, the impact of the development is considered to be not significant with regards to the annual mean PM₁₀ objective.

The number of exceedance of the PM₁₀ daily mean objective has been calculated using the formula provided in LAQM.TG(16). (Defra, 2016). The results are presented in Table 5.

Table 5: Exceedences of the daily mean PM₁₀ objective

ID	2015	2021		
		Base	Base + Committed Development	Base + Committed Development + Development
1	2	2	2	2
2	1	1	1	1
3	1	1	1	1
4	1	1	1	1

According to Table 5, no more than 2 exceedences of the daily mean objective were predicted at any modelled receptors. This is well below the permitted 35 exceedences per year. Therefore the impact of the proposed development with regards to the daily mean PM₁₀ objective is considered to be not significant.

PM_{2.5}

Annual mean concentrations of PM_{2.5} were predicted at the four receptor locations, with the results presented in Table 6. The impact of the development is presented as the magnitude of change as a proportion of the objective (% impact). The description of the impact at each receptor takes into consideration this predicted change in concentration in the context of the total concentration and its relationship with the objective (refer to Table 5 of the report).

Table 6: Predicted Annual Mean PM_{2.5} Concentrations (µg/m³)

ID	2015	2021			% Impact	
		Base	Base + Committed Development	Base + Committed Development + Development	Development Impact	Cumulative Impact
1	12.4	12.6	12.6	12.7	0.0	0.1
2	11.9	12.1	12.1	12.1	0.0	0.1
3	11.8	11.9	12.0	12.0	0.0	0.1
4	11.7	11.9	11.9	11.9	0.0	0.1

According to Table 6, the highest annual mean PM_{2.5} concentration was predicted to be experienced at Receptor 8, located on Dodworth Road, at the façade of the property adjacent to the Council monitoring site D80. A concentration of 12.7 µg/m³ was predicted at this receptor in 2021 with the committed development and the assessed development operational as well as with the development operational only. Annual mean PM_{2.5} concentrations were below the objective in all scenarios at all modelled receptors

The results indicated that when considering the impacts of the development only, detrimental impacts were predicted at all modelled receptors. The impact at all receptors was described as Negligible.

In accordance with the EPUK/IAQM (2015) guidance, the impact of the development as well as committed developments was considered. The impact at all receptors was described as Negligible.

Based on the above results, the impact of the development is considered to be not significant with regards to the annual mean PM_{2.5} objective.

Summary

In June 2016 an air quality assessment was undertaken to determine the local air quality impacts associated with a proposed development consisting of industrial and office units, alongside car parking for approximately 300 vehicles on undeveloped land on Capitol Close, Barnsley. The report, 'Capitol Park, Barnsley: Air Quality Assessment' (AECOM, 2016) was submitted as part of an outline planning application.

On 9th September 2016, an e-mail was received from Chris Shields, Technical Officer at Barnsley Metropolitan Borough Council, who provided comments in relation to the monitoring data presented in the report and requested that pollutant concentrations and impacts were predicted at additional receptors adjacent to the eastern carriageway of Dodsworth Road. This Technical Note addresses these comments.

In conclusion, the results described in this technical note do not alter the conclusions of the air quality report submitted in June 2016. The impact of the development upon local air quality can still therefore be described as not significant.