

Appendix 9.3: Air Quality Neutral Assessment

- 1.1 Calculations have been undertaken by Waterman Infrastructure & Environment (Waterman IE) to accompany the planning permission for the re-development of New City Court in the London Borough of Southwark, London. The purpose of the calculations is to demonstrate how the Development performs against relevant ‘air quality neutral’ benchmarks.

Description of the Development

- 1.2 The proposals (hereafter referred to as the ‘Development’) as described in the planning application form is as follows:
- 1.3 ‘Comprehensive redevelopment of the site to include demolition of existing 1980s office buildings and erection of a 37-storey building (including ground and mezzanine) of a maximum height of 144m (AOD), restoration and refurbishment of existing listed terrace, and redevelopment of Keats House with retention of existing façade to provide a total of 46,374 sqm of Class B1 office floorspace, 765 sqm of Class A1 retail floorspace, 1,139 sqm of Class A3 retail floorspace, 615 sqm of leisure floorspace (Class D2), 719 sqm hub space (Class B1/D2) and a 825 sqm elevated public garden, associated public realm and highways improvements, new station entrance, cycling parking, car parking, servicing, refuse and plant areas, and all ancillary or associated works.’ The Development would include two disabled car parking spaces. For the purposes of the Air Quality Neutral Assessment, the Development is in the Central Activity Zone.

Table A1: The Development Proposals

Land Use (Use Class)	Proposed Floorspace Areas GIA (m ²)
Retail (A1)	765
Restaurants and cafés (A3)	1,139
Office (B1)	46,374
Gym (D2)	615
Hub Space (B1/D2)	719
Total	49,612

Planning Policy and Guidance

The London Plan: The Spatial Development Strategy for Greater London; Consolidated with Alterations since 2011, 2016

- 1.4 Policy 7.14 ‘Improving air quality’ of the London Plan¹ states that development proposals should:
- “...be at least ‘air quality neutral’ and not lead to further deterioration of existing poor air quality (such as areas designated as AQMAs);...”*

¹ Greater London Authority (2016): The 2015 London Plan with Minor Alterations 2016, Spatial Development Strategy for Greater London, GLA, London.

Intend to Publish New London Plan, 2019

- 1.5 Policy SI1 Improving air quality of the Intend to Publish New London Plan² states that:

'A Development Plans, through relevant strategic, site-specific and area based policies, should seek opportunities to identify and deliver further improvements to air quality and should not reduce air quality benefits that result from the Mayor's or boroughs' activities to improve air quality.

B To tackle poor air quality, protect health and meet legal obligations the following criteria should be addressed.

1 Development proposals should not:

- a) lead to further deterioration of existing poor air quality;*
- b) create any new areas that exceed air quality limits, or delay the date at which compliance will be achieved in areas that are currently in exceedance of legal limits;*
- c) create unacceptable risk of high levels of exposure to poor air quality.*

2 In order to meet the requirements in Part 1, as a minimum:

- a) development proposals must be at least Air Quality Neutral*
- b) development proposals should use design solutions to prevent or minimise increased exposure to existing air pollution and make provision to address local problems of air quality in preference to post-design or retro-fitted mitigation measures.*
- c) major development proposals must be submitted with an Air Quality Assessment. Air quality assessments should show how the development will meet the requirements of B1.*
- d) development proposals in Air Quality Focus Areas or that are likely to be used by large numbers of people particularly vulnerable to poor air quality, such as children or older people should demonstrate that design measures have been used to minimise exposure.*

C Masterplans and development briefs for large-scale development proposals subject to an Environmental Impact Assessment should consider how local air quality can be improved across the area of the proposal as part of an air quality positive approach. To achieve this a statement should be submitted demonstrating:

- a) how proposals have considered ways to maximise benefits to local air quality, and*
- b) what measures or design features will be put in place to reduce exposure to pollution, and how they will achieve this.*

D In order to reduce the impact on air quality during the construction and demolition phase development proposals must demonstrate how they plan to comply with the Non-Road Mobile Machinery Low Emission Zone and reduce emissions from the demolition and construction of buildings following best practice guidance.

E Development proposals should ensure that where emissions need to be reduced to meet the requirements of Air Quality Neutral or to make the impact of development on local air quality acceptable, this is done on-site. Where it can be demonstrated that emissions cannot be further reduced by on-site measures, off-site measures to improve local air quality may be acceptable, provided that equivalent air quality benefits can be demonstrated within the area affected by the development.'."

² Greater London Authority (2018): Draft New London Plan, Spatial Development Strategy for Greater London, GLA, London.

The Mayor's Air Quality Strategy 'Clearing the Air', 2010

- 1.6 Similarly, the Mayor's Air Quality Strategy³ states that:

"New developments in London shall as a minimum be 'air quality neutral' through the adoption of best practice in the management and mitigation of emissions".

Sustainable Design and Construction - Supplementary Planning Guidance, 2014

- 1.7 The Sustainable Design and Guidance – Supplementary Planning Guidance (SPG) provides updated guidance to support the implementation of the London Plan.
- 1.8 Further to Policy 7.14 of the London Plan, Section 4.3 of the SPG focusses on air pollution and the effects from the operation of new developments within Greater London. The SPG requires all new developments to be at least 'air quality neutral'.
- 1.9 Paragraph 4.3.15 of the SPG states:
- "This policy applies to all major developments in Greater London. Developers will have to calculate the NO_x and / or PM₁₀ emissions from the buildings and transport elements of their developments and compare them to the benchmarks set out in Appendix 5 and 6."*
- 1.10 The SPG presents emission benchmarks for buildings (associated with emissions from combustion plant introduced as part of a development to provide heating and power) and transport (associated with vehicle trips related to the operation of the development). It is considered that where a development does not exceed these benchmarks, it would be 'air quality neutral' and would not increase NO_x (oxides of nitrogen) and PM₁₀ (particulate matter of 10µm diameter or less) emissions across London as a whole. A discussion on the Building Emission Benchmarks (BEBs) and the Transport Emission Benchmarks (TEBs) as set out within the SPG is presented below.
- 1.11 In addition to the BEBs and TEBs, the SPG provides emissions standards for any proposed combustion plant (individual / communal gas boilers, solid biomass or Combined Heat and Power (CHP) plant) to be introduced as part of a development. These emissions standards must be complied with.

Building Emissions Benchmarks (BEBs)

- 1.12 Paragraph 4.3.17 and Appendix 5 of the SPG note that BEBs have been defined for a series of land-use classes for both NO_x and PM₁₀. The Land Use Classes for A1-A3 (Retail), B1 (Office) and D2(e) (Gym) BEB is presented in **Table A2**.

³ Greater London Authority (GLA), 'The Mayor's Air Quality Strategy: Cleaning London's Air', London, 2002.

Table A2: 'Air Quality Neutral' Emissions Benchmarks for Buildings

Land Use Class	NO _x (g/m ²)	PM ₁₀ (g/m ²)
Class A1	22.6	1.29
Class A3 – A5	75.2	4.32
Class A2 and Class B1	30.8	1.77
Class D2(e)	284	16.3

- 1.13 It is noted that whilst the BEBs have been provided for PM₁₀, these only apply for developments which would introduce heating plants likely to produce significant PM₁₀ emissions. This would typically include heating plant operated by oil or solid fuel (including all biomass appliances). All other plant would not result in an increase in PM₁₀; therefore, an assessment against the PM₁₀ BEBs would not be required.

Transport Emissions Benchmarks (TEBs)

- 1.14 Paragraph 4.3.19 and Appendix 6 of the SPG sets out the TEBs defined by a series of land-use class for both NO_x and PM₁₀. There are no TEBs for Use Class D2, therefore the Land Use Class B1 TEBs were used as it is the nearest comparable land use to Use Class D2. There are no TEBs for Use Class A3, therefore the Land Use Class A1 TEBs were used. Using the most comparable land use TEB is current practice as set out in the Air Quality Neutral Planning Support document. The TEB is presented in **Table A3**.

Table A3: 'Air Quality Neutral' Emissions Benchmarks for Transport

Land Use	London Central Activity Zone	Inner	Outer
NO _x (g/dwelling/annum)			
Retail (A1)	169	219	249
Office (B1)	1.27	11.4	68.5
Residential (C3)	234	558	1553
PM ₁₀ (g/dwelling/annum)			
Retail (A1)	29.3	39.3	42.9
Office (B1)	0.22	2.05	11.8
Residential (C3)	40.7	100	267

Note: No Emissions Benchmark for A3, so A1 was used
No Emissions Benchmark for D2 so B1 was used

- 1.15 Section 4.3.18 of the SPG notes that the design of a development should encourage and facilitate walking, cycling and the use of public transport, thereby minimising the generation of air pollutants.
- 1.16 As well as providing benchmarks the SPG also recommends emission standards for combustion plant to comply with, in addition to meeting the overall 'air quality neutral' benchmark.

Air Quality Neutral Planning Support: GLA 80371, April 2014

- 1.17 In April 2014, the GLA published a report to provide support to the development of the Mayor's policy related to 'air quality neutral' developments. The report provides a method to enable a

development to be assessed against the air quality neutral benchmarks set out in the Sustainable Design and Construction SPG.

- 1.18 The report provides a methodology required to apply the air quality neutral policy. It requires the transport and building emissions for the development to be identified and then compared to the benchmark emissions. The report notes that the building and transport emissions should be calculated separately and not combined.

Air Quality Neutral Calculation

- 1.19 The Air Quality Neutral Assessment of the Development has been based on the approach and methodology detailed within the Air Quality Neutral Planning Support Document. The calculations are presented below.

Building Emissions

- 1.20 The energy centre for the proposed development comprises, five gas-fired boilers, two water heaters and two standby generators. The details of the energy centre are presented in **Table A4**.

Table A4: Calculation of the Total Building Emission

Unit	Total NO _x Emissions (g/s)	Hours of Operation (hrs./annum)	Total NO _x (kg/annum)
720kw Boiler	0.007	6,048	152.4
720kw Boiler	0.007	1,960	49.4
720kw Boiler	0.007	1,960	49.4
720kw Boiler	0.007	1,960	49.4
720kw Boiler	0.007	1,960	49.4
131kw Water Heater	0.00135	2,400	11.7
131kw Water Heater	0.00135	2,400	11.7
Standby Generator	1.079	15.7	61.0
Standby Generator	1.079	15.7	61.0
Total Building NO_x Emission			495.3

Note: For gas-fired plants PM₁₀ emission factors are not provided because gas-fired plants do not emit any significant level of particulates
Hours of operation provided by Chapman BDSP

- 1.21 The Development land use BEB's are presented in **Table A5** and is calculated by multiplying the floor area with the BEB presented in **Table A2**.

Table A5: Calculation of the Benchmarked NO_x Building Emission

Land Use	Floorspace GIA (m ²)	Building Emissions Benchmark (gNO _x /m ² /annum)	Benchmarked Emissions (kgNO _x /annum)
Retail (A1)	765	22.6	17.3
Restaurants and cafés (A3)	1,139	75.2	85.7
Office (B1)	46,374	30.8	1428.3
Gym (D2)	615	284	174.7
Hub Space (B1/D2)	719	30.8 [^]	22.1
Total Benchmarked Building Emissions			1,728.1

Note: [^] For a conservative assessment the B1 BEB was used rather than D2 BEB

- 1.22 The Total Building NO_x Emission of 495.3kg/annum is below the benchmark of 1,728.1kg/annum and the Development is therefore considered to be 'Air Quality Neutral', with respect to building emissions and no further abatement would be required.

Transport Emissions

- 1.23 Details of the trip generation per day for the Development have been provided by Transport Planning Practice Ltd (the Applicant's transport consultant). The calculation of the total transport emissions for the Development, as set out within the Air Quality Neutral planning support document, are presented in **Table A6**.

Table A6: Calculation of the Transport Emissions

Land Use	Trips per day	Trips per annum	Average Distance per trip ^(a)	Distance travelled km/annum	Emission Factors (g/vehicle-km) ^(b)	Transport Emission (kg/annum)	
						NO _x	PM ₁₀
Retail (A1 & A3)*	60	21,900	9.3	203,670	NO _x : 0.4224	86.0	14.9
Office (B1) [^]	123	44,895	3.0	134,685	PM ₁₀ : 0.0733	56.9	9.9
Total Transport Emissions						142.9	24.8

Note: ^(a) Average distance travelled by car per trip for sites within Central Activities Zone

^(b) Emissions factors used as presented in Table 10 of the Air Quality Neutral Planning Support Document

* Land use A3 trips have been amalgamated into A1 land use

[^]Land use D2 trips have been amalgamated into B1 land use

- 1.24 The Benchmarked Transport Emissions of the Development are calculated by multiplying the floorspace with the TEB (as presented in **Table A3**). The total benchmarked transport emissions for the Development are presented in **Table A7**.

Table A7: Calculation of the Benchmarked Transport Emissions

Land Use	GIA Floorspace (m ²)	Transport Emissions Benchmark (g/m ² /annum)		Benchmarked Emissions (kg/annum)	
		NO _x	PM ₁₀	NO _x	PM ₁₀
Retail (A1)	765	169	29.3	129.3	22.4
Restaurants and cafés (A3)*	1,139	169	29.3	192.5	33.4
Office (B1)	46,374	1.27	0.22	58.9	10.2
Gym (D2)	615	1.27	0.22	0.8	0.1
Hub Space (B1/D2)^	719	1.27	0.22	0.9	0.2
Total Transport Emissions				382.4	66.3

Note: * No Emissions Benchmark for A3 so A1 was used, in line with Guidance

^ No Emissions Benchmark for D2 so the B1 TEB was used

- 1.25 The total Transport Emissions for NO_x (142.9kgNO_x/annum) are below the Transport Benchmark NO_x Emissions (382.4kgNO_x/annum). Similarly, the Total Transport Emissions for PM₁₀ (24.8kgPM₁₀/annum) is below the Transport Benchmark PM₁₀ Emissions (66.3kgPM₁₀/annum). Therefore, the Development is 'Air Quality Neutral' in relation to transport emissions, and no further mitigation measures would be required.