

Appendix 10.2: Air Quality Neutral Calculations

Introduction

- 10.2.1 This Appendix presents the calculations undertaken by Waterman Infrastructure & Environment Limited (Waterman) to demonstrate how the Development performs against relevant ‘air quality neutral’ benchmarks.

Assumptions, Exclusions and Limitations

- 10.2.2 The Development does not propose combustion plant, it shall, therefore, not give rise to any significant adverse air quality impacts. The heating plant is therefore considered to be ‘Air Quality Neutral’ with respect to building emissions. As a result, building emissions have not been considered further within the air quality neutral assessment.
- 10.2.3 The Air Quality Neutral assessment has been based on the Greater London Authority’s Sustainable Design and Guidance – Supplementary Planning Guidance (SPG) and Air Quality Consultants Air Quality Neutral Planning Support: GLA 80371, April 2014, referred to later in this appendix. These guidance documents apply an emission benchmark based on the Land Use Classes detailed in the Use Classes Order 1987 (as amended) in force at that time. However, the most recent amendment of the Use Classes Order of 1st September 2020¹ resulted in a change to the list of Land Use Classes. However, for consistency with the guidance documents, the Land Use Classes referred to in this report reflect those in place prior to September 2020.

Description of the Development

- 10.2.4 The Development is located within Outer London and would provide a mixed-use scheme. The total amount of floorspace proposed by the Development, relevant to the Air Quality Neutral Assessment criteria is set out below in **Table A1**.

Table A1: ‘Air Quality Neutral’ Emissions Benchmarks for Buildings

Land Use (Use Class)	Use Class		Proposed Floorspace Areas
	Pre- September 2020	Current	GIA (m ²)
Residential	C3	C3	111,951
Office	B1	B1	4,547
Flexible Uses - Restaurant / bar / retail / community / leisure	A1 / A2 / A3 / A4 / B1 / D1 / Boathouse	A1 / A2 / A3 / A4 / B1 / D1 / Boathouse	4,839
Hotel	C1	C1	1,765
School	D1	D1	9,319
Cinema	D2	D2	1,606
Total			134,027

Note: Table 1 is not the Total Floor Space provided within the Development and excludes non-habitable uses such as plant and storage areas, play space, private amenity space, car park space, which are not used within the Air Quality Neutral Assessment calculations.

The AQNA assessment requires the comparison of Development against relevant benchmarks for each use class and therefore it is necessary for them to be included in Table A1.

¹ <https://www.legislation.gov.uk/uksi/1987/764/contents/made>

Planning Policy

The London Plan, March 2021

10.2.5 Policy SI1 Improving air quality of the Mayor of London's London Plan² states that:

"...a) development proposals must be at least Air Quality Neutral..."

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

10.2.6 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

10.2.7 The Sustainable Design and Guidance – Supplementary Planning Guidance (SPG) provides updated guidance to support the implementation of the London Plan.

10.2.8 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'.

10.2.9 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."

10.2.10 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.

10.2.11 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.

Air Quality Neutral Planning Support: GLA 80371, April 2014

10.2.12 In April 2014, the GLA published the Air Quality Neutral Planning Support (AQNPS): GLA 80371⁴ 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.

² Greater London Authority. 2021. The London Plan: The Spatial Development Strategy for Greater London, March 2021, GLA, London

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

⁴ Air Quality Consultants Environ Air Quality Neutral Planning Support: GLA 80371. April 2014

10.2.13 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.

Building Emissions Benchmarks (BEBs)

10.2.14 Paragraph 4.3.17 and Appendix 5 of the SPG note that Building Emission Benchmarks (BEBs) have been defined for a series of land-use classes for both NO_x and PM₁₀. The Land Use Classes are presented in **Table A2**.

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 B2 – B7	36.6	2.95
Class B8	23.6	1.90
Class C1	70.9	4.07
Class C2	68.5	5.97
Class C3	26.2	2.28
Class D1(a)	43.0	2.47
Class D1(b)	75.0	4.30
Class D1(c-h)	31.0	1.78
Class D2(a-d)	90.3	5.18
Class D2(e)	284	16.3

10.2.15 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)

10.2.16 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, presented in **Table A3**.

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

Land Use	London Central Activity Zone	Inner	Outer
NOx (g/dwelling/annum)			
Retail (A1)	169	219	249
Office (B1)	1.27	11.4	68.5
Residential (C3)	234	558	1553
PM10 (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 Use Classes A2, A3, A4, D1 and D2. Use Class B1 was used for a worst-case assessment

10.2.17 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.

10.2.18 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.

Calculation of the Development Transport Emissions

10.2.19 Details of the trip generation per day for each land-use class have been provided by Stantec - the Applicant's transport consultant. The calculation of the Transport Emissions for each component of the Development is presented in **Table A4**.

Table A4: Calculation of the Benchmarked Transport Emissions for each Land-Use Category

Land Use	Trips per annum	Average Distance per trip	Distance travelled km/annum	Emission Factors (g/vehicle-km)	Transport Emission (kg/annum)	
					NO _x	PM ₁₀
Residential	452,965	11.4	5,163,801	NO _x : 0.353 PM ₁₀ : 0.0606	1822.8	312.9
Office	143,810	10.8	1,553,148		548.3	94.1
Flexible Uses^	111,690	10.8	1,206,252		425.8	73.1
Hotel	5,110	10.8	55,188		19.5	3.3
School*	97,000	10.8	1,047,600		369.8	63.5
Cinema	59,860	10.8	646,488		228.2	39.2
Total Transport Emissions					3,414.4	586.2

Notes: Average distance travelled by car per trip for sites within Outer London

No Emissions Benchmark for Use Class C1. Use Class B1 was used

^Flexible Uses - No Emissions Benchmark for Use Classes A2, A3, A4, D1 and D2. Use Class B1 was used for a worst-case assessment

* School trips assumed for 200 days per annum

10.2.20 The Transport Benchmark for the Development, as shown in **Table A5**, can be calculated by multiplying the benchmark in **Table A3** by the number of properties within the Development.

Table A5: Calculation of the Benchmarked Transport Emissions for each Land-Use Category

Land Use	Units	GIA (m ²)	Transport Emission Benchmark		Benchmarked Emissions	
			gNO _x /m ² or dwelling/ annum	gPM ₁₀ /m ² or dwelling/ annum	kgNO _x / annum)	kgPM ₁₀ / annum
Residential	1,085	-	1553	267	1,685	289.7
Office	-	4,547	68.5	11.8	311.5	53.7
Flexible Uses*	-	4,839	158.75	27.35	768.2	132.3
Hotel		1,765	68.5	11.8	120.9	20.8
School	-	9,319	68.5	11.8	638.4	110.0
Cinema	-	1,606	68.5	11.8	110.0	19.0
Total Transport Emissions					3,633.9	625.4

Notes: Average distance travelled by car per trip for sites within Outer London Activity Zone
 ^Flexible Uses - No Emissions Benchmark for Use Classes A2, A3, A4, D1 and D2. An average of the A1 and B1 was used for a worst-case assessment
 No emissions benchmark for Use Classes, C1, D1 and D2 so the B1 was used for a worst-case assessment

10.2.21 The Total Transport NO_x Emission of 3,4414.4kg/annum (as shown in **Table A4**) is below the benchmark of 3,633.9/annum (as shown in **Table A5**) and the Total Transport PM₁₀ Emission of 586.2kg/annum (as shown in **Table A4**) is below the benchmark of 625.4kg/annum (as shown in **Table A5**).

10.2.22 The Development is therefore considered to be 'Air Quality Neutral', with respect to transport emissions, and no further mitigation measures are required.