ST. GEORGE WEST LONDON LTD.

CAMDEN GOODS YARD: PFS SITE – JUNIPER BUILDING REVISIONS

AIR QUALITY TECHNICAL NOTE

REPORT REF – 2105800-04E

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1.0 INTRODUCTION

1.1 Ardent Consulting Engineers Ltd, (ACE) have been commissioned by St. George West London Ltd. (the 'Applicant') to produce this Air Quality Technical Note (AQTN) to support this S73 application for amendments to the former Petrol Filling Station (PFS) parcel (hereafter referred to as 'the PFS parcel') which, along with the Main Site parcel (MS parcel), forms part of the Camden Goods Yard development site (hereafter referred to as 'the application site').

Previous Applications

1.2 In June 2017 a full planning application was submitted for the redevelopment of the application site. This application was accompanied an Environmental Statement (the '2017 ES') which reported on the outcomes of an Environmental Impact Assessment (EIA) of the proposed development of the application site. Planning approval was granted of in June 2018 under planning permission reference 2017/3847/P (the '2018 consented scheme').

1.3 In January 2020 a S73 application was submitted and approved in May 2020 (application reference 2020/0034/P) (the 'May 2020 consented scheme') which secured amendments to the PFS parcel for the insertion of a new development phase (Phase 1a) to allow for a single storey temporary food store to be constructed, enabling the development of the MS parcel (the former Morrisons store site) to come forward sooner. This temporary store opened in February 2021. An updated EIA was undertaken and reported in an Environmental Implications Letter (EIL) (the 'January 2020 EIL'). A second S73 application was submitted in July 2020 and approved in December 2020 (application reference 2020/3116/P) (the 'December 2020 consented scheme') for minor amendments to Blocks A, B, C and F on the MS parcel (no amendments were sought to the PFS parcel). An updated EIA was undertaken and reported in an EIL (the 'July 2020 EIL'). The most recent amendment was the submission of a S96A non-material amendment application (planning ref: 2022/0673/P) approved in February 2022 (the 'February 2022 consented scheme').

1.4 The Applicant is now submitting a third minor material amendment (MMA) S73 application (the 'August 2022 S73 application') for proposed amendments to the

consented proposals at the 'PFS parcel' of the application site (no amendments are sought to the consented development at the MS parcel). The February 2022 consented scheme as amended by the August 2022 proposed amendments are referred to as the 'August 2022 amended proposed development'.

Previous Air Quality Assessment Work

1.5 An Air Quality Assessment (AQA) (ACE, 2017) was undertaken by ACE in September 2017 as part of the 2017 ES to consider the potential air quality impacts of the development of the application site. The 2017 AQA determined that, following the implementation of appropriate mitigation[1], the overall residual effects of the proposed development[2] would be 'negligible' and not significant.

1.6 An AQA Addendum (ACE, 2020) was undertaken by ACE in July 2020, ('2020 AQA Addendum'), as part of the July 2020 EIL to assess minor amendments to Blocks A, B, C and F on the MS parcel. The 2020 AQA Addendum provided an updated assessment of air quality impacts associated with the July 2020 amended proposed development (i.e. the 'December 2020 consented scheme'), and determined that, following the implementation of appropriate mitigation[1], the overall residual effects[2] would be 'not significant', and that there would be no material difference to the overall effects as determined by the 2017 AQA (ACE, 2017).

August 2022 Amended Proposed Development

1.7 A number of amendments to the consented development on the PFS parcel are proposed. An outline of the proposed amendments comprising the August 2022 amended proposed development is provided in Section 2.0.

[1] Mitigation measures were recommended in response to emissions of dust and particulate matter (PM_{10}) during the demolition and construction phase.

[2] Based on development designs that were current at the time of undertaking the assessment.

Scope

1.8 The purpose of this AQTN is to consider whether the proposed amendments to the consented scheme and the amended proposed development as a whole would materially change the outcomes previously reported in the 2020 AQA Addendum (ACE, 2020).

1.9 The scope of this AQTN includes consideration of proposed changes to the consented scheme on the PFS parcel, changes to cumulative developments (including the removal from consideration of three lapsed cumulative schemes), changes to applicable legislation, policy, guidance and tools and changes to air quality baseline conditions since the 2020 AQA Addendum was produced.

2.0 SUMMARY OF PROPOSED CHANGES TO THE CONSENTED SCHEME

2.1 The August 2022 proposed development is as follows:

"*Variation of Condition 4 (approved drawings and documents (II/IV)), 5 (approved drawings and documents (III/IV)), 6 (approved drawings and documents (IV/IV)) and 36 (PFS retail (Phase 1b)) of planning permission 2020/3116/P dated 07/12/2020 which varied Condition 3 (approved drawings) of planning permission 2020/0034/P dated 05/05/2020 which varied condition 4 (approved drawings) of planning permission 2017/3847/P dated 15/06/2018 (as amended by 2022/0673/P dated 23/02/2022, 2021/3337/P dated 24/08/2021, 2021/2864/P dated 17/09/2021, 2020/2786/P dated 09/07/2020, 2020/2325/P dated 18/06/2020, 2019/6301/P dated 24/12/2019, 2019/0153/P dated 06/02/2019 and 2019/2962/P dated 04/07/2019) for redevelopment of the petrol filling station site and main supermarket sites; namely for: removal of petrol filling station; reconfiguration of the ground floor to incorporate additional office and retail floorspace, mezzanine level and electric vehicle charging station; internal reconfiguration of 2nd floor plan; extension of building west by approximately 6 metres resulting in an additional 1,900 sqm (GEA). This application is accompanied by an addendum to the original Environmental Statement.*"

2.2 A summary of the proposed amendments that are relevant from an air quality perspective are as follows:

- Removal of the PFS;
- Reconfiguration of ground floor layout to accommodate:
    - Additional improved office and retail floorspace and back of house (BOH) functions;
    - Enlarging the office lobby;
    - Introducing an office lobby-café;
    - Including a dedicated office cycle entrance;
    - Introducing an office mezzanine level; and

- Replacing the PFS with an electric vehicle (EV) charging station (comprising four public bays);

- Extending the building 6 m, resulting in the creation of additional office floorspace across all levels (2,207 m^2 Gross Internal Area (GIA) and an additional ground floor retail unit (50 m^2 GIA);
- Introduction of a mezzanine level to the 1st floor;
- Building footprint to the east adjusted (shifted 390 mm westwards to improve pavement widths by 0.4 m);
- Internal reconfiguration of the Corner Building by converting the retail (F&B) floorspace on Level 2 (197 m^2 GIA) to office floorspace retaining retail (F&B) at Levels 1, 3 and 4 including the winter garden;
- Reconfiguration of Morrisons floorplan to widen the frontage by one bay and reduce depth of unit to facilitate improved trading and BOH operations;
- Rationalisation of plant space at ground floor enabling the omission of plant from 2nd floor; and
- Reconfiguration of plant at roof level.

2.3 The amended site layout of the PFS parcel is shown in Appendix B.

3.0 SUMMARY OF CHANGES TO LEGISLATION, POLICY, GUIDANCE AND TOOLS

3.1 A summary of changes to relevant legislation, policy, guidance and tools used to support AQAs since the 2020 AQA Addendum (ACE, 2020) is outlined below.

National Air Quality Legislation and Strategy

The Environment Act 2021

3.2 The Environment Act 2021 (UK Government, 2021) establishes a legally binding duty on government to set a long-term target for at least one air quality matter, in addition to a separate requirement to set a target regarding annual mean $PM_{2.5}$ concentrations, by October 2022. An online consultation was undertaken regarding the proposed new targets[3] (Defra, 2022) between March and June 2022, closing on 27th June 2022.

3.3 As the proposed new targets are still subject to consultation and approval, it is not considered necessary to consider the potential impacts of the August 2022 proposed development in the context of the proposed targets. As such, this proposed change to legislation will not materially change the outcomes of the 2020 AQA Addendum (ACE, 2020).

Planning Policy

National Planning Policy

3.4 The National Planning Policy Framework (NPPF) (Ministry of Housing, Communities and Local Government, 2021) sets out the Government's planning policies for England and how they expect these to be implemented. Consideration of air quality within planning is considered an important element of this framework which recommends that transport and the potential impact on the environment should

[3] Proposed air quality targets are 1) Annual Mean $PM_{2.5}$ Concentration Target of 10 µg/m^3 to be met across England by 2040; and 2) Population Exposure $PM_{2.5}$ Reduction Target of a 35% reduction in population exposure by 2040 (as compared to a base year of 2018).

be considered at an early stage in order to allow for mitigation or even avoidance of impacts through location and layout of developments.

3.5 It is recommended that both the impacts of a potential development on the environment and the risk to new development from existing pollution be taken into account when planning policy is drafted. Furthermore these should contribute to compliance with relevant limit values or objectives and should be consistent with any local Air Quality Action Plan (AQAP).

3.6 The NPPF also recommends that *"existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed."*

3.7 It is not considered that amendments to the updated NPPF have the potential to materially change the outcome of the 2020 AQA Addendum (ACE, 2020).

Regional Planning Policy

3.8 The current London Plan (Mayor of London, 2021) was adopted in March 2021. This includes a number of references to air quality, which are all incorporated into Policy SI1: 'Improving Air Quality'.

3.9 No changes to this policy have been made since the 'Intend to Publish' London Plan (Mayor of London, 2019), which was applicable at the time of the development of the 2020 AQA Addendum (ACE, 2020). As such, it is not considered that amendments to the updated NPPF have the potential to materially change the outcome of the 2020 AQA Addendum (ACE, 2020).

Assessment Guidance

Local Air Quality Management Technical Guidance (LAQM.TG(16))

3.10 The LAQM.TG(16) guidance (Defra, 2021) was published for use by local authorities in review and assessment work, but also includes a number of technical guidelines on carrying out modelling assessment and management of monitoring data which set out best practice and are, therefore, relevant to all air quality assessments.

3.11 It is not considered that amendments to the updated NPPF have the potential to materially change the outcome of the 2020 AQA Addendum (ACE, 2020).

Air Quality Neutral Consultation Draft Guidance

3.12 In November 2021 a consultation draft version of the 'London Plan Guidance; Air Quality Neutral' (GLA, 2021a) was published by the Greater London Authority (GLA). This draft consultation guidance sets out the methodology for considering the 'air quality neutrality' of new developments, including details of updated 'air quality neutral' benchmarks (see Appendix C), as well as recommendations regarding mitigation and offsetting.

3.13 It is acknowledged that, as this guidance is at 'consultation draft' stage only, it is not technically applicable at the time of preparing this AQTN. However, much of the information within the 'current' guidance (i.e. The 'Air Quality Neutral Planning Support Update: GLA 80371' (Air Quality Consultants, 2014)) may be quite out of date. As such, it is considered appropriate and robust to reassess the 'air quality neutrality' of the August 2022 amended PFS parcel in the context of both sets of guidance (see Section 4.0). As no changes to the MS parcel are proposed, no reassessment of this element of the application site is considered to be necessary.

Air Quality Positive Consultation Draft Guidance

3.14 In November 2021 a consultation draft version of the 'London Plan Guidance; Air Quality Positive' (GLA, 2021b) was published by the GLA. This draft consultation guidance sets out the approach to considering how new developments contribute

to an 'air quality positive' scheme, as well as the required structure of an Air Quality Positive Statement.

3.15 Consideration of 'air quality positive' should typically be undertaken throughout the design process, including at an early stage in the design of a development, in order to identify opportunities to maximise air quality benefits and thus deliver an 'air quality positive' scheme. Taking into consideration that much of the August 2022 proposed development is already consented, and that the remainder is at a late stage in the design process and subject to proposed minor amendments only, it is not considered appropriate or necessary to consider 'air quality positive' at this stage of the development.

Assessment Tools

3.16 Since the 2020 AQA Addendum (ACE, 2020) was undertaken, three of the tools that were used to undertake this assessment have been updated; the Department for Environment, Food and Rural Affairs' (Defra's) Emissions Factor Toolkit (EFT), Defra's nitrogen dioxide (NO_2) from nitrogen oxides (NO_x) calculator and Defra's background maps. The most up-to-date version of Defra's EFT is v11.0 (Defra, 2021), the most up-to-date version of Defra's NO from NO calculator is v8.1 (Defra, 2019) and the most up-to-date version of Defra's background maps are the 2018-based iteration (Defra, 2020).

3.17 Defra's EFT, NO_2 from NO_x calculator and background maps are all used to inform the atmospheric dispersion modelling undertaken as part of the 2020 AQA Addendum. The version of Defra's EFT used by the 2020 AQA Addendum is v9.0 (Defra, 2019), the version of Defra's NO_2 from NO_x calculator is v7.1 (Defra, 2019) and the version of Defra's background maps used are the 2017-based iteration (Defra, 2019). The potential for changes to these tools to materially change the outcome of the 2020 AQA Addendum is discussed in Section 5.0.

4.0 SUMMARY OF CHANGES TO BASELINE CONDITIONS

4.1 A summary of changes to relevant air quality baseline conditions since the 2020 AQA Addendum (ACE, 2020) is outlined below.

Clean Air Zones

4.2 The application site is located within the Ultra Low Emission Zone (ULEZ) following the recent expansion which took effect on the 25th October 2021; at the time of undertaking the 2020 AQA Addendum the application site was not located within the ULEZ. The ULEZ charges cars, motorcycles, vans and other specialist vehicles (up to and including 3.5 tonnes) and minibuses (up to and including 5 tonnes) that do not meet the required ULEZ emissions standards when driving within the zone. The ULEZ standards are Euro III (NO_x), Euro IV (NO_x) and Euro VI (NO_x and PM) standards.

4.3 As the expansion of the ULEZ is likely to result in better air quality within the application site and in the surrounding area, it is considered that the omission of consideration of this within the 2020 AQA Addendum would result in a more conservative assessment. As such, the expansion of the ULEZ is not considered to have the potential to materially change the outcome of the 2020 AQA Addendum (i.e. the conclusion that overall effects will be 'not significant').

Monitoring

4.4 Since the 2020 AQA Addendum (ACE, 2020) was undertaken, the London Borough of Camden (LBC) has carried out further monitoring at the automatic and diffusion tube monitoring sites identified within the 2020 AQA Addendum in 2019 and 2020. Measured NO_2 concentrations from 2014 to 2020[4] are shown in **Table 4-1** and

[4] As a result of the Covid-19 pandemic and associated behavioural changes and measures implemented by the governing authorities (e.g. lockdowns, travel restrictions etc.) measured concentrations during 2020 are not considered to be representative of 'normal' conditions. As such, measured 2020 concentrations are presented for information only, and have not been discussed or given weight in determining the conclusions of this AQTN.

Table 4-2. Measured particulate matter (PM_{10} and $PM_{2.5}$) concentrations from 2014 to 2020[5] are shown in **Table 4-3**.

4.5 Exceedances of the annual mean NO_2 objective were measured at automatic monitoring sites CD1 and CD9 and at diffusion tube monitoring sites CA15, CA16, CA17 and CA23 in 2019. No exceedances of the 1-hour mean NO_2 objective were measured by the automatic monitoring sites in 2019. Furthermore, annual mean concentrations measures by diffusion tube monitoring sies in 2019 are <60 µg/m^3, indicating that no exceedances of the 1-hour mean NO_2 objective were likely.

4.6 No exceedances of the PM_{10} or $PM_{2.5}$ objectives were measured in 2019.

4.7 Measured annual mean NO_2 concentrations at diffusion tube monitoring sites CA16 and CA23 were used to verify the atmospheric dispersion modelling undertaken as part of the 2020 AQA Addendum. The potential for updated monitoring at these sites to materially change the outcome of the 2020 AQA Addendum is discussed in Section 5.0.

[5] As a result of the Covid-19 pandemic and associated behavioural changes and measures implemented by the governing authorities (e.g. lockdowns, travel restrictions etc.) measured concentrations during 2020 are not considered to be representative of 'normal' conditions. As such, measured 2020 concentrations are presented for information only, and have not been discussed or given weight in determining the conclusions of this AQTN.

Table 4-1: Measured Annual Mean NO_2 Concentrations (µg/m³)

Site ID	Site Name	Site Type	2014	2015	2016	2017	2018	2019	2020
Automatic Sites									
CD1	Swiss Cottage	Kerbside	**66**	**61**	**66**	**53**	**54**	**43**	33
CD9	Euston Road	Roadside	**98**	**90**	**88**	**83**	**82**	**70**	**43**
Diffusion Tube Sites									
CA4	Euston Road	Roadside	**90**	**87**	**83**	**93**	**69**	**69**	**52**
CA15	Swiss Cottage	Kerbside	**74**	**69**	**74**	-	**62**	**50**	-
CA16	Kentish Town Road	Roadside	**58**	**64**	**59**	**75**	**55**	**45**	33
CA17	47 Fitzjohn's Road	Roadside	**60**	**56**	**56**	**66**	**48**	**43**	34
CA20	Brill Place	Roadside	**52**	**49**	**48**	**53**	**41**	**43**	**43**
CA23	Camden Road	Roadside	**72**	**63**	**62**	**69**	**56**	**52**	**43**
Objective			**40**						

Exceedances of the annual mean objective are shown in **bold**. Measured concentrations >60 µg/m³ are shown in **bold underline**.
2019 and 2020 data have been taken from LBC's 2020 Air Quality Annual Status Report (ASR) (LBC, 2021).

Table 4-2: Measured Exceedances of the Hourly Mean NO_2 Objective

Site ID	Site Name	Site Type	Number of Hours >200 µg/m³						
			2014	2015	2016	2017	2018	2019	2020
CD1	Swiss Cottage	Kerbside	14	11	**37**	1	2	1	0
CD9	Euston Road	Roadside	**221**	**54**	**39**	**25**	18	7	0
Objective			**18**						

Exceedances of the annual mean objective are shown in **bold**.
2019 and 2020 data have been taken from LBC's 2020 ASR (LBC, 2021).

Table 4-3: Measured PM_{10} and $PM_{2.5}$ Concentrations (µg/m³) and Exceedances

Site ID	Site Name	Site Type	2014	2015	2016	2017	2018	2019	2020
Annual Mean PM_{10} (µg/m³)									
CD1	Swiss Cottage	Kerbside	22	20	21	20	21	19	16
CD9	Euston Road	Roadside	29	18	24	20	21	22	18
Objective			**40**						
PM_{10} Number of Days >50 µg/m³									
CD1	Swiss Cottage	Kerbside	12	8	7	8	4	8	3
CD9	Euston Road	Roadside	5	5	10	3	2	8	2
Objective			**35**						
Annual Mean $PM_{2.5}$ (µg/m³)									
CD1	Swiss Cottage	Kerbside	-	12	15	16	11	11	10
CD9	Euston Road	Roadside	-	17	17	14	15	14	11
Objective			**20**						

2019 and 2020 data have been taken from LBC's 2020 ASR (LBC, 2021).

5.0 AIR QUALITY IMPACTS

5.1 Proposed changes to the design of the August 2022 proposed development, changes in legislation, policy, guidance and assessment tools, changes in cumulative schemes and changes in baseline conditions have the potential to alter the conclusions of the 2020 AQA Addendum (ACE, 2020). The potential for material changes is discussed below.

Construction Impacts

Construction Dust

5.2 The 2020 AQA Addendum (ACE, 2020)) concludes that appropriate mitigation measures corresponding to a 'medium risk' site are required during the demolition and construction stage of the development.

5.3 It is judged that the proposed changes to the design of the development outlined by the August 2022 proposed development are not sufficient to result in material changes to the outcome of the 2020 AQA Addendum'[6]; i.e. following implementation of the level of mitigation recommended within the 2020 AQA Addendum, residual effects would be 'not significant'.

5.4 There are no changes to legislation, policy, guidance or assessment tools that would have the potential to materially change the outcome of the 2020 AQA Addendum, as there are no changes to such that would affect the assessment methodology.

5.5 There are no changes to cumulative schemes that would have the potential to materially change the outcome of the 2020 AQA Addendum, as the recommended mitigation will remain the same regardless.

5.6 The only changes to baseline air quality conditions that would have the potential to affect the outcome of the 2020 AQA Addendum would be changes in baseline

[6] This includes the assumption that volumes and routing of construction traffic would not materially change, as compared to the February 2022 consented scheme (as confirmed by the project's transport team; ACE).

PM_{10} as a result of the demolition and construction phase occurring at a later date than assumed by the 2020 AQA Addendum. However, as it is generally accepted that concentrations of PM_{10} will reduce throughout the UK in the coming decade, the approach adopted by the 2020 AQA Addendum is considered to be conservative and, therefore, still appropriate. As such, it is judged that changes to baseline conditions would not have the potential to materially change the outcome of the 2020 AQA Addendum.

5.7 The above conclusion is applicable to the whole application site, as amended in accordance with the August 2022 proposed development.

Demolition and Construction Traffic Impacts

5.8 The 2020 AQA Addendum (ACE, 2020) assessed the potential for impacts as a result of emissions of NO_2, PM_{10} and $PM_{2.5}$ associated with development-generated demolition and construction traffic. The assessment concluded that the change in traffic associated with the demolition and construction stage would result in an overall reduction in trips when compared to the baseline traffic (though with a slight increase in the volume of Heavy Duty Vehicles (HDVs)) and that, therefore, the overall emissions were considered to be similar to baseline levels.

5.9 Volumes of development-generated demolition and construction traffic for the August 2022 proposed development are not anticipated to materially change as compared to the those reported in the 2020 AQA Addendum[7]. As such, it is judged that changes to development design as a result of the August 2022 proposed development would not materially affect the outcomes of the 2020 AQA Addendum.

5.10 There are no changes to legislation, policy, guidance or assessment tools that would have the potential to materially change the outcome of the 2020 AQA Addendum, as there are no changes to such that would affect the assessment methodology.

[7] Based on information provided by the project's transport team; ACE.

5.11 There are no changes to cumulative schemes that would have the potential to materially change the outcomes of the 2020 AQA Addendum, as the presence of cumulative schemes does not form part of the assessment criteria.

5.12 There are no changes to air quality baseline conditions that would have the potential to materially change the outcomes of the 2020 AQA Addendum, as the baseline air quality conditions do not form part of the assessment criteria.

5.13 The above conclusion is applicable to the both the PFS parcel and the whole application site, as amended in accordance with the August 2022 proposed development.

Completed Development Effects

Development-generated Road Traffic Impacts

5.14 The 2020 AQA Addendum (ACE, 2020) assessed the potential for impacts on existing residences in the local area as a result of changes in concentrations of NO_2, PM_{10} and $PM_{2.5}$ associated with development-generated completed development traffic. Predicted impacts were concluded to be 'negligible' at each receptor, and the overall effect was judged to be 'not significant'.

5.15 The proposed changes to the development design as a result of the August 2022 proposed development would result in a substantial reduction in traffic generated by both the PFS parcel and the whole application site during the completed development stage, as compared with those reported in the 2020 AQA Addendum (i.e. a reduction of 1,492 Annual Average Daily Traffic (AADT)) and also as compared to the previous baseline use of the application site (i.e. a reduction of 1,406 AADT)[7]. Furthermore, the proposed amendments would result in the provision of four publicly available EV charging bays as well as an increase in the number of cycle parking spaces (an increase of 114 long-stage spaces and 40 short-stage spaces). These changes have the potential to contribute to a wider shift in transport patterns by promoting forms of transport with lower / zero associated emissions, thus contributing to further reducing emissions. Taking into consideration the above, it is judged that the August 2022 proposed development would not materially affect the outcome of the 2020 AQA Addendum; i.e. the overall effect of development-generated completed development traffic would be

'not significant'. This conclusion is applicable to the both the PFS parcel and the whole application site, as amended in accordance with the August 2022 proposed development.

5.16 Since the 2020 AQA Addendum was undertaken, Defra has revised the EFT (Defra, 2021), NO_2 from NO_x calculator (Defra, 2019) and background maps (Defra, 2020) tools, which have the potential to changes the modelled concentrations of pollutants. Taking into consideration the relatively low modelled process contributions (PCs) of pollutants at identified existing sensitive receptors (maximum PCs of 0.43 µg/m^3 NO_2, 0.03 µg/m^3 PM_{10} and 0.02 µg/m^3 $PM_{2.2}$), it is considered to be unlikely that any changes to predicted concentrations as a result of changes to these tools would be insufficient to result in a material change to the outcomes of the 2020 AQA Addendum. Furthermore, when taking into consideration that the modelled outcomes presented within the 2020 AQA Addendum are based on assumptions that are now worst-case in terms of modelled traffic and baseline conditions (see Paragraphs 5.15 and 5.18), it is considered that any potential worsening of predicted impacts as a result of changes to the tools, would be likely to be offset by the overall reduction in development-generated traffic and measured pollutants concentrations at local monitoring sites.

5.17 There are no changes to cumulative schemes that would have the potential to materially change the outcomes of the 2020 AQA Addendum, as any changes to cumulative schemes are considered to be unlikely to cause the traffic data on which the 2020 AQA Addendum is based to become materially more worst-case[7].

5.18 The modelling undertaken as part of the 2020 AQA Addendum was verified using 2018 monitoring data. Since the assessment was undertaken, further monitoring has been undertaken by LBC at the sites used to verify the model. However, as measured concentrations at both verification sites (CA16 and CA23) are lower in both 2019 and 2020 than in 2018 (see **Table 4-1**), any update to the 2018 verification based solely on changes to the verification site monitoring results[8] (i.e.

[8] Confirmed by the project's transport consultant (ACE).

updated to 2019 or 2020[9]) would result in a lower adjustment factor and, therefore, lower predicted concentrations. As such, the approach adopted by the 2020 AQA Addendum is considered to be conservative and, therefore, still appropriate. This being the case, it is judged that changes to baseline conditions would not have the potential to materially change the outcome of the 2020 AQA Addendum. This conclusion is applicable to the both the PFS parcel and the whole application site, as amended in accordance with the August 2022 proposed development.

Site Suitability

5.19 The 2020 AQA Addendum (ACE, 2020) predicted annual mean concentrations of NO_2, PM_{10} and $PM_{2.5}$ at sensitive locations within the application site (including the PFS parcel) and compared the concentrations to the relevant national air quality objectives (see **Appendix C**). Predicted concentrations were demonstrated to be below the relevant objectives at all identified sensitive locations and, therefore, it was judged that air quality within the application site was 'good' and that the application site was suitable for its intended end-use.

5.20 The August 2022 proposed development would result in material changes to the location of areas of relevant exposure to air pollutants within the PFS parcel. All relevant exposure[10] (i.e. the proposed retail and winter garden space) are sensitive to the 1-hour mean NO_2 objective only (see **Appendix C**). Within the 2020 AQA Addendum, receptors G1, G2, G3 and G4 were modelled at a height of 1.5 m (representing ground floor level); these receptors are considered to still be adequately representative of proposed sensitive locations within the August 2022 proposed development (in particular, receptors G1 and G2 are considered to be

[9] As a result of the Covid-19 pandemic and associated behavioural changes and measures implemented by the governing authorities (e.g. lockdowns, travel restrictions etc.) measured concentrations during 2020 are not considered to be representative of 'normal' conditions. As such, it is advised that atmospheric dispersion modelling should not be verified using 2020 monitoring data.

[10] The proposed office space is not considered to be relevant exposure in terms of the national air quality objectives, as the national air quality objectives apply to members of the public only.

representative of worst-case locations). Predicted concentrations of NO_2 at receptors G1, G2, G3 and G4 were found by the 2020 AQA Addendum to be well below the proxy value for the 1-hour mean NO_2 objective[11] (i.e. 60 µg/m^3). As such, it is judged that the PFS parcel, taking into consideration the proposed amendments as part of the August 2022 proposed development, is suitable for its proposed end-use; i.e. the application site is suitable for its proposed end-use. It is not considered to be necessary or appropriate to re-evaluate predicted concentrations of pollutants within the MS site, as this is already consented and no amendments to this site are being sought.

5.21 Since the 2020 AQA Addendum was undertaken, Defra has revised the EFT (Defra, 2021), NO_2 from NO_x calculator (Defra, 2019) and background maps (Defra, 2020) tools, which have the potential to changes the modelled concentrations of pollutants. Taking into consideration that the modelled concentrations of NO_2 within the PFS parcel (as presented within the 2020 AQA Addendum) are substantially below the proxy for the applicable national objective[11] (a maximum concentration of 39.6 µg/m^3 is predicted, against the proxy national objective of 60 µg/m^3), it is considered that any changes to predicted concentrations that could occur as a result of changes to these tools would be insufficient to result in a material change to the outcomes of the 2020 AQA Addendum. Furthermore, when taking into consideration that the modelled outcomes presented within the 2020 AQA Addendum are based on assumptions that are now worst-case in terms of modelled traffic and baseline conditions (see Paragraphs 5.15 and 5.18), it is considered that any potential worsening of predicted impacts as a result of changes to the tools, would be likely to be offset by the overall reduction in development-generated traffic and measured pollutants concentrations at local monitoring sites. It is not considered to be necessary or appropriate to re-evaluate predicted concentrations of pollutants within the MS site, as this is already consented and no amendments to this site are being sought.

5.22 There are no changes to cumulative schemes that would have the potential to materially change the outcomes of the 2020 AQA Addendum, as changes to

[11] Only the 1-hour mean NO_2 national objective is applicable within the Site.

cumulative schemes are considered to be unlikely to cause the traffic data on which the 2020 AQA Addendum is based to become materially more worst-case[7].

5.23 The modelling undertaken as part of the 2020 AQA Addendum was verified using 2018 monitoring data. Since the assessment was undertaken, further monitoring has been undertaken by LBC at the sites used to verify the model, it is judged that changes to baseline conditions would not have the potential to materially change the outcome of the 2020 AQA Addendum (as discussed in Paragraph 5.18). This conclusion is applicable to the both the PFS parcel and the whole application site, as amended in accordance with the August 2022 proposed development.

Air Quality Neutral; Transport Emissions

5.24 The 2020 AQA Addendum (ACE, 2020) found calculated development transport NO_x and PM_{10} emissions to be below the calculated Transport Emission Benchmarks (TEBs) for the application site and, therefore, it was judged that the development was 'air quality neutral' in terms of transport emissions.

5.25 The 'Sustainable Design and Construction' SPG (GLA, 2014b) was developed in 2014 as part of the Implementation Framework for the London Plan 2016 (Mayor of London, 2016). The SPG has since been revoked, however, the current London Plan (Mayor of London, 2021) still includes the requirement that development proposal must be 'at least Air Quality Neutral'. The 'current' 'Air Quality Neutral Planning Support Update: GLA 80371' (Air Quality Consultants, 2014) sets out details of the 'air quality neutral' benchmarks (see **Appendix D**).

5.26 Further draft guidance has recently (November 2021) been published (GLA, 2021a) for consultation. This updated draft guidance includes revised 'air quality neutral' benchmarks and, therefore, has the potential to change the outcome of the assessment previously undertaken as part of the 2020 AQA Addendum.

5.27 Additionally, changes to development design as part of the August 2022 proposed development would affect the 'air quality neutral' calculations in the following ways:

1. Changes to the GIA of each land use type would affect the applicable TEBs; and

2. Changes to the total volume of operational development-generated traffic.

5.28 There are no changes to cumulative schemes that would have the potential to materially change the outcomes of the 2020 AQA Addendum, as the presence of cumulative schemes does not form part of the assessment criteria.

5.29 There are no changes to air quality baseline conditions that would have the potential to materially change the outcomes of the 2020 AQA Addendum, as the baseline air quality conditions do not form part of the assessment criteria.

5.30 Two separate re-assessments of the 'air quality neutrality' of both the PFS parcel and the whole application site are presented below, one based on the 'current' guidance and one based on the 'consultation draft' guidance.

'Current' Air Quality Neutral Guidance Assessment; PFS Parcel

5.31 An updated 'air quality neutral' assessment has been undertaken based on the methodology and supporting information set out within the 'current' guidance (i.e. The 'Air Quality Neutral Planning Support Update: GLA 80371' (Air Quality Consultants, 2014)) (see Appendix D).

5.32 The air quality neutral calculation and comparison of transport emissions and TEBs for the PFS parcel (as amended by the August 2022 proposed development) are described in **Table 5-1** to **Table 5-4**. Land use categories specified have been defined using the categories provided by the 'current' 'Sustainable Design and Construction' SPG (GLA, 2014b) (i.e. pre-September 2020 land use class definition). Trips associated with the PFS parcel do not include trips by electric vehicles, as emissions associated with such vehicles will be minimal (restricted to PM_{10} and $PM_{2.5}$ emissions associated with road, tyre and break wear only).

Table 5-1: TEB Calculation

Land Use Class [a] (Guidance Category)	GIA (m^2)	Transport Benchmark Rates (kg / m^2 / annum)		Proposed Development TEB (kg / annum)	
		NO_x	PM_{10}	NO_x	PM_{10}
Retail (A1)[a]	1,013	0.219	0.039	222	40
Office (B1)[b]	12,329	0.011	0.002	141	25
Total	**-**	**-**	**-**	**362**	**65**

[a] Land use classes A1 - A3 have been classified as 'A1', following the approach taken by the 2020 AQA Addendum. All other land uses have been assumed to be associated with the proposed 'B1' land use as this results in a lower benchmark, thus providing a more conservative assessment.

Table 5-2: Proposed Development Trip Generation

Land Use Class (Guidance Category)	Trips / Day	Trips / Annum	Average Distance Travelled / Trip (km)	Distance Travelled / Annum (km)
Retail (A1)	24	8,760	5.9	51,684
Office (B1)	90	32,850	7.7	252,945
Total	**114**	**41,610**	**-**	**304,629**

[a] Land use classes A1 - A3 have been classified as 'A1', following the approach taken by the 2020 AQA Addendum.

Table 5-3: Proposed Development Transport Emission Calculation

Land Use Class (Guidance Category)	Emissions Factors (g / vehicle-km)		Annual transport Emissions (kg / annum)	
	NO_x	PM_{10}	NO_x	PM_{10}
Retail (A1)	0.3700	0.0665	19	3
Office (B1)	0.3700	0.0665	94	17
Total	**-**	**-**	**113**	**20**

Table 5-4: Proposed Development Emissions and TEB Comparison (kg/annum)

Land Use Class (Guidance Category)	Benchmarked Emissions		Proposed Development Emissions		Comparison to Benchmarked Emissions	
	NO_x	PM_{10}	NO_x	PM_{10}	NO_x	PM_{10}
Retail (A1)	222	40	19	3	-203	-36
Office (B1)	141	25	94	17	-47	-8
Total	**362**	**65**	**113**	**20**	**-250**	**-45**

5.33 The calculated transport NO_x and PM_{10} emissions are below the calculated TEBs for the proposed retail element and above the calculated TEBs for the proposed office element. The overall combined transport NO_x and PM_{10} emissions for PFS parcel (as amended by the August 2022 proposed development) are below the combined calculated TEBs, therefore, the PFS parcel (as amended by the August 2022 proposed development) is judged to be better than 'air quality neutral' in terms of transport emissions when the 'current' air quality neutral guidance is applied; i.e. there is no material change to the outcome of the 2020 AQA Addendum.

'Consultation Draft' Air Quality Neutral Guidance Assessment; PFS Parcel

5.34 In November 2021 a consultation draft version of the 'London Plan Guidance; Air Quality Neutral' (GLA, 2021a) was published for consultation by the GLA (see Paragraphs 3.12 and 3.13 and **Appendix D**). The calculated 'air quality neutrality' of the PFS parcel (as amended by the August 2022 proposed development), in accordance with the consultation draft guidance, is set out below.

5.35 The air quality neutral calculation and comparison of transport emissions and TEBs for the PFS parcel (as amended by the August 2022 proposed development) are described in **Table 5-5** to **Table 5-7**. Land use categories specified have been defined using the categories provided by the consultation draft 'London Plan Guidance; Air Quality Neutral' (GLA, 2021a).

5.36 The TEB benchmarks only include car or light van trips generated by development occupiers (e.g. residents, customers or employees) and does not include trips generated by deliveries and servicing, taxis of heavy vehicle movements from non-occupiers, however, the PFS parcel (as amended by the August 2022 proposed development) trips rates do include deliveries; this assumption is worst-case. Trips

associated with the PFS parcel do not include trips by electric vehicles, as emissions associated with such vehicles will be minimal (restricted to PM_{10} and $PM_{2.5}$ emissions associated with road, tyre and break wear only).

Table 5-5: Proposed Development TEBs

Land Use [a] (Guidance Category)	GIA (m^2)	Standard Benchmark Trip Rate (trips / m^2 /annum)	TEB (trips / annum)
Restaurant / Café [a]	1,013	137	138,781
Office / Light Industrial [b]	12,329	1	12,329
Total	**-**	**-**	**151,110**

[a] Two categories defined by the guidance ('restaurant / café' and 'Retail (Convenience)') are considered to be appliable to the proposed A1 – A3 land use; of these two options, the definition of 'restaurant / café' results in a lower benchmark and more conservative assessment; as such, this definition has been applied. All other land use classes have been assumed to be associated with the proposed 'office / light industrial' land use as this results in a lower benchmark, thus providing a more conservative assessment.

Table 5-6: Proposed Development Trip Rates

Combined Total	Trip Rate (trips / day)	Trip Rate (trips / annum)
Proposed Development	114	41,639

Table 5-7: Comparison of Proposed Development Trips Rates and BEBs

Land Use [a]	TEB (trips / annum)	Proposed Development Trip Rates (trips / annum)	Comparison (trips / annum)
Total	**151,110**	**41,639**	**-109,472**

5.37 The calculated overall combined trips rate associated with the PFS parcel (as amended by the August 2022 proposed development) is below the calculated combined TEB. Therefore, the PFS parcel (as amended by the August 2022 proposed development) can be considered to be better than 'air quality neutral' in

terms of transport emissions; i.e. there is no material change to the outcome of the 2020 AQA Addendum.

'Current' Air Quality Neutral Guidance Assessment; Application Site

5.38 An updated 'air quality neutral' assessment has been undertaken based on the methodology and supporting information set out within the 'current' guidance (i.e. The 'Air Quality Neutral Planning Support Update: GLA 80371' (Air Quality Consultants, 2014)) (see Appendix D).

5.39 The air quality neutral calculation and comparison of transport emissions and TEBs for the application site (as amended by the August 2022 proposed development) are described in **Table 5-8** to **Table 5-11**. Land use categories specified have been defined using the categories provided by the 'current' 'Sustainable Design and Construction' SPG (GLA, 2014b) (i.e. pre-September 2020 land use class definition). Trips associated with the PFS parcel do not include trips by electric vehicles, as emissions associated with such vehicles will be minimal (restricted to PM_{10} and $PM_{2.5}$ emissions associated with road, tyre and break wear only).

Table 5-8: TEB Calculation

Land Use Class [a] (Guidance Category)	GIA / Residences (m^2 / No. Dwellings)	Transport Benchmark Rates (kg / m^2 / annum)		Proposed Development TEB (kg / annum)	
		NO_x	PM_{10}	NO_x	PM_{10}
Retail (A1)[a]	19,661	0.219	0.039	4,306	773
Office (B1)[b]	19,851	0.011	0.002	226	41
Residential (C3)	644	0.56	0.10	359	64
Total	**-**	**-**	**-**	**4,891**	**878**

[a] Land use classes A1 - A3 have been classified as 'A1', following the approach taken by the 2020 AQA Addendum. All other land uses have been assumed to be associated with the proposed 'B1' land use as this results in a lower benchmark, thus providing a more conservative assessment.

Table 5-9: Proposed Development Trip Generation

Land Use Class (Guidance Category) [a]	Trips / Day	Trips / Annum	Average Distance Travelled / Trip (km)	Distance Travelled / Annum (km)
Retail (A1)	1,954 [b]	713,210	5.9	4,207,939
Office (B1)	60	21,900	7.7	168,630
Residential (C3)	241	87,965	3.7	325,471
Total	**2,255**	**823,075**	**-**	**4,702,040**

[a] Land use classes A1 - A3 have been classified as 'A1', following the approach taken by the 2020 AQA Addendum.

[b] The net change in vehicle trips associated with the August 2022 proposed development is assumed to be entirely associated with the retail land use; this is a worst-case assumption.

Table 5-10: Proposed Development Transport Emission Calculation

Land Use Class (Guidance Category)	Emissions Factors (g / vehicle-km)		Annual transport Emissions (kg / annum)	
	NO_x	PM_{10}	NO_x	PM_{10}
Retail (A1)	0.3700	0.0665	1,557	280
Office (B1)	0.3700	0.0665	62	11
Residential (C3)	0.3700	0.0665	120	22
Total	**-**	**-**	**1,740**	**313**

Table 5-11: Proposed Development Emissions and TEB Comparison (kg/annum)

Land Use Class (Guidance Category)	Benchmarked Emissions		Proposed Development Emissions		Comparison to Benchmarked Emissions	
	NO_x	PM_{10}	NO_x	PM_{10}	NO_x	PM_{10}
Retail (A1)	4,306	773	1,557	280	-2,749	-493
Office (B1)	226	41	62	11	-164	-29
Residential (C3)	359	64	120	22	-239	-43
Total	**4,891**	**878**	**1,740**	**313**	**-3,152**	**-565**

5.40 The calculated transport NO_x and PM_{10} emissions are substantially below the calculated TEBs for the retail, office and residential elements, and the overall

combined transport NO_x and PM_{10} emissions for the application site are below the combined calculated TEBs. As such, the application site (as amended by the August 2022 proposed development) is judged to be substantially better than 'air quality neutral' in terms of transport emissions when the 'current' air quality neutral guidance is applied. I.e. there is no material change to the outcome of the 2020 AQA Addendum.

'Consultation Draft' Air Quality Neutral Guidance Assessment; Application Site

5.41 In November 2021 a consultation draft version of the 'London Plan Guidance; Air Quality Neutral' (GLA, 2021a) was published for consultation by the GLA (see Paragraphs 3.12 and 3.13 and **Appendix D**). The calculated 'air quality neutrality' of the application site (as amended by the August 2022 proposed development), in accordance with the consultation draft guidance, is set out below.

5.42 The air quality neutral calculation and comparison of transport emissions and TEBs for the application site (as amended by the August 2022 proposed development) are described in Table 5-12 to **Table 5-13**. Land use categories specified have been defined using the categories provided by the consultation draft 'London Plan Guidance; Air Quality Neutral' (GLA, 2021a). Trips associated with the PFS parcel do not include trips by electric vehicles, as emissions associated with such vehicles will be minimal (restricted to PM_{10} and $PM_{2.5}$ emissions associated with road, tyre and break wear only).

Table 5-12: Proposed Development TEBs

Land Use [a] (Guidance Category)	GIA / Residences (m^2/ No. Dwellings)	Standard Benchmark Trip Rate (trips / m^2 /annum)	TEB (trips / annum)
Restaurant / Café [a]	19,661	137	2,693,557
Office / Light Industrial [b]	19,851	1	19,851
Residential	644	114	73,416
Total	**-**	**-**	**2,786,824**

[a] Two categories defined by the guidance ('restaurant / café' and 'Retail (Convenience)') are considered to be appliable to the proposed A1 – A3 land use; of these two options, the definition of 'restaurant / café' results in a lower benchmark and more conservative assessment; as such, this definition has been applied. All other land use classes (except residential) have been assumed to be associated with the proposed 'office / light industrial' land use as this results in a lower benchmark, thus providing a more conservative assessment.

Table 5-13: Comparison of Proposed Development Trips Rates and BEBs

	TEB (trips / annum)	Development Trip Rate (trips / annum)	Comparison (trips / annum)
Total	**2,786,824**	**823,639**	**-1,963,185**

5.43 The calculated overall combined trip rate associated with the application site (as amended by the August 2022 proposed development) is substantially below the calculated combined TEB. Therefore, the application site (as amended by the August 2022 proposed development) can be considered to be substantially better than 'air quality neutral' in terms of transport emissions (i.e. there is material change to the outcome of the 2020 AQA Addendum), when the consultation draft air quality neutral guidance is applied.

Summary

5.44 The PFS parcel (as amended by the August 2022 proposed development) has been determined to be better than 'air quality neutral' in terms of transport emissions in the context of both the 'current' guidance (Air Quality Consultants, 2014) and

the 'consultation draft' guidance (GLA, 2021a). As such, when the PFS parcel (as amended by the August 2022 proposed development) is considered in isolation, this results in no material change to the outcome of the 2020 AQA Addendum; i.e. the PFS parcel is better than 'air quality neutral' in terms of transport emissions.

5.45 The application site (as amended by the August 2022 proposed development) has been determined to be substantially better than 'air quality neutral' in terms of transport emissions in the context of both the 'current' and the consultation draft guidance. As such, when the whole application site (as amended by the August 2022 proposed development) is considered, this results in no material change to the outcome of the 2020 AQA Addendum in the context of the whole site; i.e. the application site is substantially better than 'air quality neutral' in terms of transport emissions.

Air Quality Neutral; Building Emissions

5.46 The 2020 AQA Addendum (ACE, 2020) found calculated development building NO_x emissions to be below the calculated Building Emission Benchmark (BEB). On this basis, the July 2020 amended proposed development was judged to be 'air quality neutral' in terms of transport emissions.

5.47 The energy strategy associated with the PFS parcel (as amended by the August 2022 proposed development) will be all-electric and, therefore, will not have any associated on-site emissions. As such, there is no potential for the building emissions associated with the PFS parcel to cause the PFS parcel or the application site to be worse than 'air quality neutral'; i.e. there is no potential for material change to the outcomes of the 2022 AQA Addendum, regardless of any changes to the relevant guidance.

5.48 There are no changes to cumulative schemes that would have the potential to materially change the outcomes of the 2020 AQA Addendum, as the presence of cumulative schemes does not form part of the assessment criteria.

5.49 There are no changes to air quality baseline conditions that would have the potential to materially change the outcomes of the 2020 AQA Addendum, as the baseline air quality conditions do not form part of the assessment criteria.

6.0 CONCLUSIONS

6.1 This Air Quality Technical Note has been prepared to consider whether changes to the design of the August 2022 proposed development, changes to relevant legislation, policy, guidance and tools, to cumulative schemes and changes to air quality baseline conditions will materially alter the conclusions of the 2020 AQA Addendum (ACE, 2020).

6.2 The outcome of the 2020 AQA Addendum assessment of potential construction dust impacts would not materially change; i.e. following implementation of the mitigation considered within the 2020 AQA Addendum, residual impacts would be 'not significant'.

6.3 The outcome of the 2020 AQA Addendum assessment of potential impacts associated with development-generated construction traffic would not materially change.

6.4 The outcome of the 2020 AQA Addendum assessment of potential impacts associated with development-generated completed development traffic at off-site receptors would not materially change; i.e. the overall effect of development-generated completed development traffic would be 'not significant'.

6.5 The outcome of the 2020 AQA Addendum assessment of potential impacts associated with development-generated completed development traffic would not materially change; i.e. the site is suitable for its proposed end-use.

6.6 The PFS parcel (as amended by the August 2022 proposed development) in isolation is considered to be better than 'air quality neutral' in terms of transport emissions in the context of both the 'current' guidance and the 'consultation draft' guidance; i.e. no material change to the outcome of the 2020 AQA Addendum is predicted. Furthermore, the whole application site (as amended by the August 2022 proposed development) has been determined to be substantially better than 'air quality neutral' in terms of transport emissions in the context of both the 'current' and the consultation draft guidance; i.e. there in no material change to the outcome of the 2020 AQA Addendum in the context of the whole site.

6.7 The outcome of the 2020 AQA Addendum assessment of 'air quality neural' I terms of building emissions would not materially change; i.e. both the PFS parcel and the application site are better than air quality neutral' in terms of building emissions.

6.8 Overall, it is considered that the proposed changed to the development, changes to legislation, policy, guidance and tools, updated list of cumulative schemes and changes to baseline conditions would not materially affect the outcomes of the 2022 AQA Addendum.

7.0 REFERENCES

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Appendix A Glossary

Abbreviations	Meaning
AADT	Annual Average Daily Traffic
ACE	Ardent Consulting Engineers Ltd.
AQA	Air Quality Assessment
AQAP	Air Quality Action Plan
AQTN	Air Quality Technical Note
ASR	Annual Status Report
BEB	Building Emission Benchmark
BOH	Back of House
CHP	Combined Heat and Power
EIA	Environmental Impact Assessment
EIL	Environmental Impact Letter
EV	Electric vehicle
GIA	Gross Internal Area
GLA	Greater London Authority
HDV	Heavy Duty Vehicle; a vehicle with a gross vehicle weight greater than 3.5 tonnes, includes Heavy Goods Vehicles and buses
LBC	London Borough of Camden
MMA	Minor Material Amendment
NAQO	National Air Quality Objective
NO_2	Nitrogen dioxide
NO_x	Nitrogen oxides
NPPF	National Planning Policy Framework
PC	Process Contribution
PFS	Petrol Filling Station
PM	Particulate matter
PM_{10} or $PM_{2.5}$	Small airborne particles less than 10/2.5 µg in diameter
Receptor	A location where the effects of pollution may occur
TEB	Transport Emission Benchmark

Appendix B Proposed Development Ground Floor Layout

Figure B.1: Proposed PFS Parcel Ground Floor Layout

(Data taken from Makower Architects drawing no. -CGY-MAK-XX-00-DR-A-02-150 Rev. PI)

Appendix C National Air Quality Objectives

C1.1 National Air Quality Objectives (NAQOs) were defined by The Air Quality Strategy **(Defra, 2007)** and enshrined in regulations by the Air Quality Standards Regulation **(Statutory Instrument, 2010, No 1001)** and Air Quality Standards (Amendment) Regulations **(Statutory Instrument, 2016 No. 1184)** which implemented the European Union Directive on ambient air quality and cleaner air for Europe **(Directive 2008/50/EC)**. Relevant objectives are set out in **Table C-1**.

Table C.1: NO_2, PM_{10} and $PM_{2.5}$ Objectives

Pollutant	Time Period	Objective
Nitrogen Dioxide (NO_2)	1-hour mean	200 µg/m^3 not to be exceeded more than 18 times a year
	Annual mean	40 µg/m^3
Particulate Matter (PM_{10})	24-hour mean	50 µg/m^3 not to be exceeded more than 35[12] times a year
	Annual mean	40 µg/m^3 [13]
Particulate Matter ($PM_{2.5}$)	Annual mean	25 µg/m^3 [14]
	Annual mean	20 µg/m^3 [15]
	Exposure reduction target	15% reduction between 2010 and 2020 at Urban Background sites

C1.2 Analysis of long-term monitoring data suggests that if the annual mean nitrogen dioxide (NO_2) concentration is less than 60 µg/m^3 then the 1-hour

[12] 7 times a year for Scotland

[13] 18 µg/m^3 for Scotland

[14] 12 µg/m^3 for Scotland

[15] Indicative stage 2 limit value post 2020, derived based on the exposure reduction target of a 15% reduction between 2010 and 2020. This value has been used as the relevant air quality objective throughout this assessment in order to ensure a conservative approach.

mean NO_2 objective is unlikely to be exceeded where road transport is the main source of pollution **(Defra, 2016)**. This concentration has therefore been used in this Air Quality Technical Note to screen whether an exceedance of the 1-hour mean NO_2 objective is likely. Similarly, an annual mean particulate matter (PM_{10}) concentration of 32 µg/m^3 is used to screen whether an exceedance of the 24-hour mean PM_{10} objective is likely.

C1.3 London Local Air Quality Management Technical Guidance 2019 (LLAQM.TG(19) **(Mayor of London, 2019)** provides guidance to local authorities as to where objectives apply. These are summarised in **Table C-2**.

Table C-2: Relevant Exposure

Averaging Period	Relevant Locations	Objectives should apply	Objectives don't usually apply
Annual mean	Where individuals are exposed for a cumulative period of 6 month in a year	Façades and gardens of residential properties, schools, care homes and hospitals	Façade of offices or other places of work where members of the pubic do not have regular access, hotels and areas where public exposure is expected to be short-term.
24-hour mean	Where individuals are expected to be exposed for 24-hours or longer	As above, with the addition of hotels and gardens of residences	Kerbside sites and areas where the public exposure is expected to be short-term
1-hour mean	Where individuals are expected to spend one hour or longer	As above, with the addition of locations with regular access such as car parks, bus stations, railway stations and any partially enclosed or outdoor location where members of the public might reasonably be expected to spend one hour or longer.	Kerbside sites where members of the public would not be expected to have regular access.

Appendix D Air Quality Neutral Benchmarks

D1 'Current' Guidance; 'Air Quality Neutral Support Update: GLA 80371'

Air Quality Neutral Benchmarks for Buildings

D1.1 Table D.1 shows the Building Emissions Benchmarks (BEBs) set out within the Air Quality Neutral guidance **(Air Quality Consultants, 2014)**, based on the gross internal floor area for each type of development class.

Table D.1: 'Air Quality Neutral' Building Emission Benchmarks (BEBs)

Land Use Class	NO_x (g/m²/annum)	PM_{10} (g/m²/annum)
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
D1 (a)	43.0	2.47
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

Gross Internal Area (GIA) is used to define the area.

Air Quality Neutral Emissions Benchmarks for Transport

D1.2 Transport Emission Benchmarks (TEBs) have been defined within the Air Quality Neutral Guidance **(Air Quality Consultants, 2014)** for NO_x and PM_{10}, for Retail (A1 and A2), Commercial (B1) and living accommodation (C3) use classes. These are set out in Table D.2, below.

Table D.2: 'Air Quality Neutral' Transport Emissions Benchmarks (TEBs)

Land Use Class	Benchmark		
	CAZ	Inner	Outer
NO_x (g/m²/annum)			
Retail (A1)	169	219	249
Office (B1)	1.27	11.4	68.5
NO_x (g/dwelling/annum)			
Residential (C3,C4)	234	558	1,553
PM_{10} (g/m²/annum)			
Retail (A1)	29.3	39.3	42.9
Office (B1)	0.22	2.05	11.8
PM_{10} (g/dwelling/annum)			
Residential (C3,C4)	40.7	100	267

Gross Internal Area (GIA) is used to define the area.

D1.3 The emission for comparison against the TEB is calculated for each land-use category as:

trips/annum * average distance per trip * emission rate

D1.4 The average distance per trip and emissions rates should be those set out within the guidance and are shown in **Table D.3** and **Table D.4**.

Table D.3: Average Distance Travelled by Car per Trip

Land Use Class	Distance (km)		
	CAZ	Inner	Outer
Retail (A1)	9.3	5.9	5.4
Office (B1)	3.0	7.7	10.8
Residential (C3,C4)	4.3	3.7	11.4

Table D.4: Emissions Factors

Pollutant	Distance (km)		
	CAZ	Inner	Outer
NO_x	0.4224	0.370	0.353
PM_{10}	0.0733	0.0665	0.0606

D1.5 Where TEBs have not been calculated, the air quality neutrality of a proposed development can be shown through comparison against trip numbers set out in Table D.5.

Table D.5: Benchmark Trips per Annum

Land Use	Number of Trips (trips/m²/annum)		
	CAZ	Inner	Outer
A3	153	137	170
A4	2.0	8.0	-
A5	-	32.4	590
B2	-	15.6	18.3
B8	-	5.5	6.5
C1	1.9	5.0	6.9
C2	-	3.8	19.5
D1	0.07	65.1	46.1
D2	5.0	22.5	49.0

D2 Consultation Draft Guidance; 'London Plan Guidance; Air Quality Neutral'

Air Quality Neutral Benchmarks for Buildings

D2.1 Table D.6 shows the NO_x BEBs set out within the consultant draft 'London Plan Guidance; Air Quality Neutral' **(GLA, 2021a)** based on the area for various types of development class[16]. The NO_x BEBs are based on achievable emission rates for the type of technology used.

D2.2 The BEB for PM is defined by the consultant draft guidance as being zero. As such, any development that uses plant with solid or liquid fuels (e.g. biomass) for primary or secondary heating will not be 'air quality neutral'.

D2.3 The guidance specifies that "*Backup plant installed for emergency and life safety power supply, such as diesel generators, may be excluded from the calculation of predicted building emissions*", on the basis that it would generally be assumed that emissions associated with such plant would be restricted to operational testing and emergencies.

[16] Separate use classes for commercial uses, including retail and offices, have now been replaced by use class E. If these separate uses are specified in the development proposal, they should be used for this assessment. Where the intended use is not specified, or where use class E has been specified, the benchmark for retail should be used (GLA, 2021a).

Table D.6: BEBs NO_x Emission Rates ($gNO_x/m^2/annum$)

Land Use Class	Individual Gas Boilers	Gas Boiler Network	CHP + Gas Boiler Network	Heat Pumps + Gas Boiler Network
Residential	3.5	5.7	7.8	5.7
Retail	0.53	0.97	4.31	0.97
Restaurants and bars	1.76	3.23	14.34	3.23
Offices	1.43	2.62	11.68	2.62
Industrial	1.07	1.95	8.73	1.95
Storage and distribution	0.55	1.01	4.5	1.01
Hotel	9.47	15.42	38.16	15.42
Care homes and hospitals	9.15	14.9	36.86	14.9
Schools, nurseries, doctor's surgeries and other non-residual institutions	0.9	1.66	7.39	1.66
Assembly and leisure	2.62	4.84	21.53	4.84

Air Quality Neutral Emissions Benchmarks for Transport

D2.4 Table D.7 shows the benchmark trips rates set out within the consultant draft 'London Plan Guidance; Air Quality Neutral' **(GLA, 2021a)** based on number of residences / GIA for various types of development class[17]. Benchmark trip rates are based on data from TRAVL (Trip Rate Assessment Valid for London) and are defined for different land uses and different areas of London.

[17] Separate use classes for commercial uses, including retail and offices, have now been replaced by use class E. If these separate uses are specified in the development proposal, they should be used for this assessment. Where the separate use is not specified, or where use class E has been specified, the benchmark for office / light industrial should be used (GLA, 2021a).

Table D.7: Benchmark Trip Rates (annual trips/dwelling or m²)[a]

Land Use	Central Activities Zone	Inner London	Outer London
Residential	68	114	447
Office / Light Industrial	2	1	16
Retail (Superstore)	39	73	216
Retail (Convenience)	18	139	274
Restaurant / Café	64	137	170
Drinking establishment	0.8	8	-
Hot food takeaway	-	32.4	590
Industrial	-	3.9	16.3
Storage and distribution	-	1.4	5.8
Hotel	1	1.4	6.9
Care home / hospital	-	1.1	19.5
Schools, nurseries, doctor's surgeries, other non-residential institutions	0.1	30.3	44.4
Assembly and leisure	3.6	10.5	47.2

[a] Annual trips / dwelling is applicable to proposed residential land use. Annual trips / m^2 is applicable to all other land uses.