Air Quality Note:
Berrite Industrial Estate, Hillingdon

September 2023

Experts in air quality management & assessment

Document Control

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1 Introduction

1.1 Air Quality Consultants Ltd undertook an air quality assessment in 2022 for the proposed development at the Berrite Industrial Estate in Hillingdon (AQC, 2022). The proposed development is described as:

"*Redevelopment of the site to provide 3 no, replacement industrial units (Use Class E(g) (III), B2 and/or B8 uses), surface level car parking and associated works (works involve demolition of existing Units 6, 7 and 8)*".

1.2 At the time that the air quality assessment was produced, the project Transport Consultant (Acstro Ltd), advised that the proposed development was expected to generate five additional Annual Average Daily Traffic (AADT) movements for Light Duty Vehicles (LDVs) and one additional Heavy Duty Vehicle (HDV) movement, compared to the existing use of the site. This daily trip increase is below the screening threshold of 25 HDVs and 100 LDVs within an Air Quality Management Area (AQMA) recommended in the Environmental Protection UK/Institute of Air Quality Management (EPUK/IAQM) guidance (Moorcroft and Barrowcliffe et al, 2017). As such, there was judged to be no requirement for a detailed assessment of road traffic impacts at existing receptors and it was concluded that the proposed development would not have a significant impact on local roadside air quality.

1.3 The air quality neutral assessment set out in the air quality assessment was based on the GLA's London Plan Guidance (Air Quality Neutral) Consultation Draft (GLA, 2021a). The trip generation of the proposed development exceeded the Transport Emission Benchmark (TEB) and as such it was concluded that the proposed development was not air quality neutral in terms of transport emissions. The air quality neutral guidance has since been updated and adopted (GLA, 2023).

1.4 The air quality officer at the London borough of Hillingdon (LBH) provided comments on the planning application (reference 45237/APP/2022/3398). The comments include a calculation of air quality damage costs based on the latest air quality neutral guidance. The calculation was based on the trip generation of the proposed development set out within the Transport Statement (Acstro Ltd, 2022) (216 vehicle movements per day), however this figure is based on peak work day movements for both LDVs and HDVs. It therefore should not be multiplied by 365 to calculate total annual trips, which it appears is what was done. In addition, the air quality neutral guidance states that:

"*The TEB only estimates car or light van trips undertaken directly by the development occupiers (residents, businesses etc and their staff / customers). The TEB does not include 'operational' trips generated by the developments. Deliveries and servicing, taxis or heavy vehicle movements from non-occupiers' assessment of these trips, for example, should be captured in the wider air quality impact assessment where one is required and should therefore be excluded from TEB calculations.*"

1.5 Therefore, the trip rate used to compare against the TEB should not include HDVs, nor should it include LDV trips for delivery and servicing. It appears that no adjustment was made to account for HDV, delivery and servicing trips.

1.6 The Transport Statement has since been revised to include a minor correction to the Gross Internal Area (GIA) that was used to calculate the anticipated trip rates. In addition, a one-day survey was undertaken at the Berrite Industrial Estate in September 2023 to provide a more realistic estimate of existing and proposed trips generated by the application site, and additional work has been done to reduce the trip rate of the proposed development through a Travel Plan (Acstro Ltd, 2023). This note provides a review of the air quality impact assessment and air quality neutral assessment to take account of these changes.

2 Air Quality Impact Assessment

2.1 The revised trip rates provided by Acstro Ltd indicate that the proposed development would be expected to generate 127 vehicle trips per working day, 12 of which are HDVs. The implementation of the Travel Plan is expected to reduce the LDV trips to 92 per day (20% reduction). The existing use at the application site currently generates approximately 133 vehicle trips per working day, 12 of which are HDVs. Thus, the proposed development will lead to a small reduction in vehicle trips (three LDVs per working day), and thus it will not have a significant impact on local roadside air quality.

3 Air Quality Neutral Calculations

3.1 The purpose of the London Plan's requirement that development proposals be 'air quality neutral' is to prevent the gradual deterioration of air quality throughout Greater London. The 'air quality neutrality' of a proposed development, as assessed in this section, does not directly indicate the potential of the proposed development to have significant impacts on human health (this has been assessed separately in the previous section). The air quality neutral assessment has been undertaken using the latest GLA's London Plan Guidance (Air Quality Neutral) (GLA, 2023).

Building Emissions

3.2 The proposed development does not include any combustion plant for the routine provision of electricity, heating or hot water and will thus have no direct building emissions. The proposed development is, therefore, better than air quality neutral in terms of building emissions.

Road Transport Emissions

3.3 Acstro Ltd has advised that the proposed development is expected to generate a total of 12,057 LDV trips per year. This figure is based on 92 LDV trips per working day, 46 of which are delivery and

servicing trips; the relevant trip rate for the air quality neutral assessment is therefore 46. This trip rate has been multiplied by 250 working weekdays (11,400 trips). Allowing for some Saturday working (approximately 30% of the weekday flows, and assuming 28 working Saturdays per year), an additional 657 LDV trips have been included in the annual trip rate. This value is set out in Table 1.

3.4 Appendix A1 provides the Benchmark Trip Rates based on the Gross Internal Area (GIA) of an industrial land use, which is the most stringent of the relevant planning use classes for this development. The GIA has been provided by AFA Architects & Planners Limited. Table 1 shows calculation of the TEB for this development.

3.5 The total development trip rate is greater than the TEB. The proposed development is thus not air quality neutral in terms of transport emissions.

Table 1: Calculation of Transport Benchmarks for the Development [a]

Use Class	GIA (m^2)	Benchmark		Annual Trips from Development
		trips/m^2/yr	Trips/yr	
Industrial	1,271	6.5	8,262	12,057

[a] Each trip is 1-way (i.e., a return journey would be two trips). Excludes delivery and servicing trips.

Summary

3.6 While the proposed development will be better than air quality neutral in terms of building emissions, its trip generation exceeds the air quality neutral benchmark derived for an average industrial development in outer London. Mitigation will be required to account for the excess transport emissions above the air quality neutral benchmark; this is discussed in the next Section.

4 Offsetting Payment

4.1 The air quality neutral assessment shows that the proposed development exceeds the trip rate benchmark. As such, an offsetting payment calculation has been undertaken using the methodology detailed within section 5.2 of the guidance (GLA, 2023).

4.2 The calculations of the excess annual emissions from transport are shown in Table 2, with the offsetting amount presented in Table 3. The total 30-year offsetting amount is **£30,742.44**.

Table 2: Excess Emissions for Road Transport

Description	NOx		$PM_{2.5}$	
	Development	Benchmark	Development	Benchmark
Total Car Trips per Year [a]	12,057	8,262	12,057	8,262
Average Distance per Trip (km)	10.8		10.8	
Emissions per Vehicle-km (g)	0.35		0.028	
Total Transport Emissions (kg/annum)	45.6	31.2	3.6	2.5
Excess Emissions (tonnes/annum)	**0.0143**		**0.0011**	

[a] Each trip is 1-way (i.e., a return journey would be two trips).

Table 3: Offsetting Amount Calculation

Description	Excess Emissions (tonnes)	Central Damage Cost (£/tonne)	Annual Offsetting Amount (£)
Transport Emissions NOx	0.0143	£33,064 [a]	474.37
Transport Emissions $PM_{2.5}$	0.0011	£246,942 [a]	283.43
Annual Total	-	-	**757.80**
30-yr Total [b]	-	-	**30,742.44**

[a] Central cost for Outer London road transport NOx/$PM_{2.5}$ emissions from Defra's guidance on 'air quality appraisal: damage cost guidance'**Error! Bookmark not defined.**.

[b] This is required in the GLA guidance (GLA, 2023), which specifies the calculation:
$\{(Annual\ Total\ Offsetting\ Amount) x [(1 + 2\%\ uplift)^{30\ years} - 1]\}/2\%\ uplift$

5 Mitigation Measures

5.1 The current proposals provide the following mitigation measures to reduce the impact of the operation of the proposed development on local air quality:

- 100% electrically powered development with roof top solar panels;
- one fast Electric Vehicle (EV) charging space;
- one passive EV charging space to be upgrade at a later date; and
- 12 secure covered cycle parking spaces.

5.2 The following additional mitigation measures, intended to offset the excess transport emissions, have been proposed by the developer:

- 14 additional fast EV charging spaces, bringing the total to 16 EV charging spaces;

- 12 additional secure covered cycle parking spaces, bringing the total to 24 (16 cycle spaces to the front of the proposed units with a further eight cycle spaces located in the secure yard areas); and
- three showers and three sets of lockers - one accessible shower per unit and locker provision, to encourage active travel.

5.3 The anticipated implementation costs for each of the above measures are provided in Table 4. The total implementation cost, before taking into account ongoing maintenance costs (**£73,450**) is well in excess of the offsetting amount set out in Table 3 (**£30,742**).

Table 4: Projected Implementation Costs of Mitigation Measures

Proposed Mitigation	Cost of Implementation	Cost of 30-year Lifespan	Total Projected Cost
14 Fast EV Charging Spaces	14 x £2,750 = £38,500	14 x 2 replacements @ £900 = £25,200	£63,700
3 Accessible Showers and Locker Provision	3 x £7,800 = £23,400	3 x 2 replacement shower unit @ £780 = £4,680	£28,080
12 Secure and Covered Cycle Parking Spaces	3 x £3,850 = £11,550	3 x £1,500 = £4,500	£16,050
Total	**£73,450**	**£34,380**	**£107,830**

5.4 The planning authority will need to confirm whether the proposed measures are deemed adequate in meeting the air quality neutral requirements.

6 References

Acstro Ltd (2022) *Replacement Industrial Units Berrite Estate - Transport Statement*.

Acstro Ltd (2023) *Replacement Industrial Units Berrite Estate - Travel Plan*.

AQC (2022) *Air Quality Assessment: Berrite Industrial Estate, London Borough of Hillingdon. Report No. J10/13612A/10/1/F1*.

GLA (2021a) *London Plan Guidance - Air Quality Neutral. Consultation Draft*, Available: https://www.london.gov.uk/what-we-do/planning/implementing-london-plan/supplementary-planning-guidance/sustainable-design-and.

GLA (2021b) *The London Plan: The Spatial Development Strategy for London*, Available: https://www.london.gov.uk/sites/default/files/the_london_plan_2021.pdf.

GLA (2023) *London Plan Guidance - Air Quality Neutral*, Available: https://www.london.gov.uk/programmes-strategies/planning/implementing-london-plan/london-plan-guidance/air-quality-neutral-aqn-guidance.

Moorcroft and Barrowcliffe et al (2017) *Land-Use Planning & Development Control: Planning For Air Quality v1.2*, IAQM, London, Available: http://iaqm.co.uk/guidance/.

A1 'Air Quality Neutral' Methodology

A1.1 The GLA's London Plan Guidance; Air Quality Neutral (GLA, 2023) provides an approach to assessing whether a development is air quality neutral. The approach is to compare the expected emissions from the building's energy use and vehicle trips against defined benchmarks for buildings and transport in London.

A1.2 The benchmarks for heating and energy plant (termed 'Building Emissions Benchmarks' or 'BEBs') are set out in Table A1.1, while the 'Transport Emissions Benchmarks' ('TEBs') are set out in Table A1.2.

A1.3 The average trip length and average emission per vehicle are required if there is a need to calculate offset payments. The values given by GLA are set out in Table A1.3 and Table A1.4 respectively.

Table A1.1: Building Emissions Benchmark NO_x Emission Rates ($gNO_x/m^2/annum$) [a]

Land Use [b]	Individual Gas Boilers	Gas Boiler Network	CHP + Gas Boiler Network	Heat Pumps + Gas Boiler Network
Residential (including student accommodation and large-scale purpose-built shared living development)	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	14.90	36.86	14.90
Schools, nurseries, doctors' surgeries, other non-residential institutions	0.90	1.66	7.39	1.66
Assembly and leisure	2.62	4.84	21.53	4.84

[a] Solid and liquid biomass appliances also emit fine particulate matter in addition to NO_x. The benchmark emission rate for particulate matter is zero.

[b] 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.

Table A1.2: Benchmark Trip Rates

Land Use	Annual trips per	Benchmark Trip Rates		
		Central Activities Zone (CAZ)	Inner London (excluding CAZ)	Outer London
Residential (including student accommodation and large-scale purpose-built shared living development)	dwelling	68	114	447
Office / Light Industrial	m^2 (GIA)	2	1	16
Retail (Superstore)	m^2 (GIA)	39	73	216
Retail (Convenience)	m^2 (GIA)	18	139	274
Restaurant / Café	m^2 (GIA)	64	137	170
Drinking establishments	m^2 (GIA)	0.8	8	N/A
Hot food takeaway	m^2 (GIA)	N/A	32.4	590
Industrial	m^2 (GIA)	N/A	5.6	6.5
Storage and distribution	m^2 (GIA)	N/A	5.5	6.5
Hotels	m^2 (GIA)	1	1.4	6.9
Care homes and hospitals	m^2 (GIA)	N/A	1.1	19.5
Schools, nurseries, doctors' surgeries, other non-residential institutions	m^2 (GIA)	0.1	30.3	44.4
Assembly and leisure	m^2 (GIA)	3.6	10.5	47.2

Table A1.3: Emission factors per vehicle-km

Pollutant	Emission factors (g/veh-km)		
	Central Activities Zone (CAZ)	Inner London [a] (excluding CAZ)	Outer London [a]
NOx	0.48	0.39	0.35
$PM_{2.5}$	0.036	0.032	0.028

[a] Inner London and Outer London as defined in the London Plan (GLA, 2021b).

Table A1.4: Average Distance Travelled by Car per Trip

Land use	Distance (km)		
	Central Activity Zone	Inner	Outer
Residential	4.2	3.4	11.4
Office	3.0	7.2	10.8
Retail	9.2	5.5	5.4