Appendix 6: Air Quality

Block 4, Union Park

March 2025

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Appendix 6.1: Legislation and Planning Policy

London Local Air Quality Management

The London Local Air Quality Management (LLAQM) framework[1] is the statutory process used by London authorities to review and improve air quality within their administrative boundaries. This framework was designed to specifically meet London's needs.

The LLAQM framework provides London-specific policy and technical guidance (LLAQM.PG(19) and LLAQM.TG(19)) for the London boroughs. Although both are largely based on the previous national Defra Local Air Quality Management (LAQM) guidance (2016), they incorporate London-specific elements of the LAQM system.

Obligations under the Environment Act 1995 require local authorities to declare an Air Quality Management Area (AQMA) at sensitive receptor locations where an objective concentration has been predicted to be exceeded. In setting an AQMA, the local authority must then formulate an Air Quality Action Plan (AQAP) to seek to reduce pollution concentrations to values below the objective levels.

Air Quality Management Areas

The London Borough of Hillingdon (LBH) declared an AQMA encompassing the southern two-thirds of the borough in 2003 due to exceedances of the UK Air Quality Standard (AQS) for annual mean concentrations of nitrogen dioxide (NO_2).

Air Quality Action Plan

In response to the declaration of this AQMA in 2003, LBH have produced and updated AQAPs with the intention of reducing both emissions and exposure to emissions within the borough and its AQMA. LBH's latest AQAP (2019-2024)[2] at the time of writing, targets key areas such as emissions from idling vehicles, reducing emissions from combined heat and power plants (CHP) and transition to zero emission transport to reduce emissions of, and exposure to, air pollution within the borough.

One of LBH's priorities outlined in the latest AQAP is to ensure *"the planning system supports the achievement of air quality improvements in relation to new development"*. Furthermore, it states: *"new developments incorporate air quality positive design measures from the outset"* and that *"suitable mitigation measures will be sought to reduce pollution increases associated with new development, especially in areas where the air quality is already poor"*.

1 London Local Air Quality Management (LLAQM) Framework.
2 London Borough of Hillingdon. (2019). *Air Quality Action Plan, 2019-2024*.

Air Quality Focus Areas

In addition to AQMAs, the Greater London Authority (GLA) has designated ten Air Quality Focus Areas (AQFA) within Hillingdon. AQFAs are locations which have been identified by the GLA as having both high levels of NO_2 and significant human exposure.

The application site is partially located within the Hayes AQFA, which encompasses an area of Hayes including sections of North Hyde Road, Station Road, The Parkway and surrounding sensitive uses. The location of this AQFA is displayed in Figure 6.1.

There are a number of AQFAs in the vicinity of the application site; including the Hayes North Hyde Road AQFA, which is found, at its closest point, circa 160m to the south of the main site and encompasses the closest residential dwellings. The location of this AQFA is presented in Figure 1.

London Ultra Low Emission Zone

The Mayor of London has also developed the London Clean Air Action Plan. As part of this process, in addition to the existing Low Emission Zone (LEZ), the central London Ultra-Low Emission Zone (ULEZ) was introduced on 8th of April 2019, and expanded in August 2023 to encompass all London Boroughs. The application site is located within the London LEZ and ULEZ.

National Planning Policy Framework

The National Planning Policy Framework (NPPF)[3], which was updated in December 2024, sets out the Government's planning policy for England. At its heart is an intention to promote more sustainable development.

A core principle in the NPPF that relates to air quality effects from development is that planning should "contribute to conserve and enhance the natural and local environment". In achieving this, it states in Paragraph 180 that:

"Planning policies and decisions should contribute to and enhance the natural and local environment by: […]

preventing new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as water and air quality […]".

With regard to assessing cumulative effects the NPPF states the following at Paragraph 191:

"Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on

3 Ministry of Housing, Communities & Local Government. (2024). *National Planning Policy Framework.*

health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development."

Regarding compliance with relevant limit values and national objectives for pollutants the NPPF, Paragraph 192 states:

"Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan."

The NPPF offers a broad framework but does not afford a detailed methodology for assessments. Specific guidance for air quality continues to be provided by organisations such as the Department for Environment, Food and Rural Affairs (Defra), Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM).

National Planning Practice Guidance

Reference ID 32: Air Quality of the National Planning Practice Guidance (PPG)[4], which was updated in November 2019, provides guiding principles on how planning can take account of the impact of new development on air quality. The PPG summarises the importance of air quality in planning and the key legislation relating to it.

As well as describing the importance of International, National and Local Policies, it summarises the key sources of air quality information. It also explains when air quality is likely to be relevant to a planning decision, stating:

"Considerations that may be relevant to determining a planning application include whether the development would:

- *Lead to changes (including any potential reductions) in vehicle-related emissions in the immediate vicinity of the proposed development or further afield. This could be through the provision of electric vehicle charging infrastructure; altering the level of traffic congestion; significantly changing traffic volumes, vehicle speeds or both; or significantly altering the traffic composition on local roads. Other matters to consider include whether the proposal involves the development of a bus station, coach or*

4 Planning Practice Guidance (PPG) 32. (Updated November 2019). *Air Quality*. Available at: http://planningguidance.planningportal.gov.uk/blog/guidance/air-quality/.

lorry park; could add to turnover in a large car park; or involve construction sites that would generate large Heavy Goods Vehicle flows over a period of a year or more;

- *Introduce new point sources of air pollution. This could include furnaces which require prior notification to local authorities; biomass boilers or biomass-fuelled Combined Heat and Power plant; centralised boilers or plant burning other fuels within or close to an air quality management area or introduce relevant combustion within a Smoke Control Area; or extraction systems (including chimneys) which require approval or permits under pollution control legislation;*

- *Expose people to harmful concentrations of air pollutants, including dust. This could be by building new homes, schools, workplaces or other development in places with poor air quality;*

- *Give rise to potentially unacceptable impacts (such as dust) during construction for nearby sensitive locations;*

- *Have a potential adverse effect on biodiversity, especially where it would affect sites designated for their biodiversity value."*

Details are also provided of what should be included within an air quality assessment. Key considerations include:

- Baseline local air quality;
- Whether the proposed development could significantly affect local air quality during construction/operation; and
- Whether the development is likely to expose more people to poor air quality.

Examples of potential air quality mitigation measures are also provided in the PPG.

London Specific Planning Policy

The Mayor's Air Quality Strategy to tackle air quality across London as a whole was published in 2010. This was replaced by the Mayor's Environment Strategy in 2018, and is supported by the new London Plan[5], which was published in 2021.

Policy SI1 'Improving air quality' of the latest (2021) London Plan 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.

5 Greater London Authority. (2021). *The London Plan*.

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:

1) how proposals have considered ways to maximise benefits to local air quality, and

2) 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."

London Low Emissions Zone for Non Road Mobile Machinery (NRMM)

London has introduced the Central Activity Zone (CAZ) for NRMM to reduce emissions from construction site machinery in key areas of London.

The NRMM CAZ was introduced as current estimates of emissions from NRMM used on construction sites were shown to be responsible for 7% of NO_X emissions, 14% of $PM_{2.5}$ emissions and 8% of PM_{10} emissions across London.

It must be ensured that all NRMM to operate on-site comply with London's current and future policy for NRMM.

To this end, any NRMM with a power rating of between 37 kW and 560 kW operating on-site will be required to meet emissions stage IV of EU Directive 97/68/EC for variable speed engines and emissions stage V for constant-speed engines (such as those typically found in generators).

NRMM emission standards will continue to tighten in the future, with all NRMM operating in London required to meet Stage V emission standards from 1st January 2030.

Local Planning Policy

Alongside the London Plan, the Hillingdon Development Plan forms the statutory basis for planning decisions in the Borough. The Development Plan consists of a number of documents, including the Local Plan: Part 1 – Strategic Policies[6] and the Local Plan: Part 2 – Development Management Policies[7].

Of particular relevance to air quality is Policy EM8: Land, Water, Air and Noise, from the Local Plan: Part 1, which states:

"Air Quality

All development should not cause deterioration in the local air quality levels and should ensure the protection of both existing and new sensitive receptors.

All major development within the Air Quality Management Area (AQMA) should demonstrate air quality neutrality (no worsening of impacts) where appropriate; actively contribute to the

6 London Borough of Hillingdon. (2012). *Local Plan: Part 1 Strategic Policies* [Adopted November 2012]
7 London Borough of Hillingdon. (2020). *Local Plan Part 2 Development Management Policies* [Adopted January 2020].

promotion of sustainable transport measures such as vehicle charging points and the increased provision for vehicles with cleaner transport fuels; deliver increased planting through soft landscaping and living walls and roofs; and provide a management plan for ensuring air quality impacts can be kept to a minimum.

The Council seeks to reduce the levels of pollutants referred to in the Government's National Air Quality Strategy and will have regard to the Mayor's Air Quality Strategy. London Boroughs should also take account of the findings of the Air Quality Review and Assessments and Actions plans, in particular where Air Quality Management Areas have been designated.

The Council has a network of Air Quality Monitoring stations but recognises that this can be widened to improve understanding of air quality impacts. The Council may therefore require new major development in an AQMA to fund additional air quality monitoring stations to assist in managing air quality improvements."

Also relevant is Policy DMEI 14: Air Quality, from the Local Plan: Part 2, which states:

"A) Development proposals should demonstrate appropriate reductions in emissions to sustain compliance with and contribute towards meeting EU limit values and national air quality objectives for pollutants.

B) Development proposals should, as a minimum:

i. *be at least "air quality neutral";*

ii. *include sufficient mitigation to ensure there is no unacceptable risk from air pollution to sensitive receptors, both existing and new; and*

iii. *actively contribute towards the improvement of air quality, especially within the Air Quality Management Area."*

Of some relevance is Policy DMEI 1: Living Walls and Roofs, which states:

"All development proposals are required to comply with the following:

i. *All major development6 should incorporate living roofs and/or walls into the development. Suitable justification should be provided where living walls and roofs cannot be provided; and*

ii. *Major development in Air Quality Management Areas must provide onsite provision of living roofs and/or walls. A suitable offsite contribution may be required where onsite provision is not appropriate."*

Appendix 6.2: Sensitivity Test for Future Standards

Upon reviewing Phlorum's Air Quality Scoping Note (Ref: 13528A (AQ) V3), the London Borough of Hillingdon (LBH) stated the following:

"Please note that LBH does not use either the EA Process contribution approach (which is used for their permitting purposes nor the IAQM significance criteria (which is outdated and does not take into account WHO targets and London Plan and Defra PM2.5 requirements) - none of them take location into consideration in relation to Focus Areas. I attach significance criteria for PM2.5 developed by LBH for use in the EIA for ambient air quality, for NO2 please adjust the 2017 IAQM planning guidance to reflect 10µg/m^3 annual mean target (WHO, 2021) and not 40 as previously assumed"

LBH request an annual mean NO_2 Air Quality Standard (AQS) of 10 µg.m^{-3} be applied in this air quality assessment, rather than the UK's legally binding and widely accepted annual mean AQS of 40 µg.m^{-3}. Whilst the intent to achieve the WHO (2021) guideline target concentration is appreciated, it is impractical to expect an urban area in LBH to achieve this threshold. As is discussed in ES Chapter 6 – Air Quality, Defra do not predict that the local area will be able to achieve such low concentrations until well beyond 2040. As such, it was not deemed reasonable to apply this new threshold within the main body of the ES Chapter.

However, for completeness, a sensitivity test has been undertaken, with results presented in this Appendix, assessing the Proposed Development's air quality impacts against the 10 µg.m^{-3} annual mean NO_2 threshold.

Table A6.2.1: Predicted annual mean NO_2 concentrations with Proposed Development following routine testing and maintenance, assessed against LBH's threshold.

Receptor ID	Annual Mean Concentrations (µg.m^{-3})			Air Quality Impact	
	Baseline Concentration	UP4 Process Contribution	Predicted Total Concentration	Change as % of LBH Target	Impact Descriptor
R3	21.97	0.047	22.02	0.47	Negligible
R4	21.89	0.022	21.91	0.22	Negligible
R5	20.42	0.002	20.43	0.02	Negligible
R11	22.15	0.011	22.16	0.11	Negligible
R12	21.73	0.020	21.75	0.20	Negligible
R14	22.69	0.004	22.70	0.04	Negligible
R15	22.31	0.009	22.32	0.09	Negligible
R16	21.44	0.002	21.45	0.02	Negligible
R17	21.22	0.002	21.23	0.02	Negligible
R18	22.03	0.020	22.05	0.20	Negligible

Receptor ID	Annual Mean Concentrations (µg.m^{-3}) Baseline Concentration	UP4 Process Contribution	Predicted Total Concentration	Air Quality Impact Change as % of LBH Target	Impact Descriptor
R21	22.05	0.019	22.07	0.19	Negligible
R22	23.48	0.003	23.49	0.03	Negligible

Table A6.2.2: Predicted annual mean NO_2 concentrations with Proposed Development following a 24-hour power outage, assessed against LBH's threshold.

Receptor ID	Annual Mean Concentrations (µg.m^{-3}) Baseline Concentration	UP4 Process Contribution	Predicted Total Concentration	Air Quality Impact Change as % of LBH Target	Impact Descriptor
R3	21.98	0.088	22.07	0.88	Moderate
R4	21.90	0.041	21.94	0.41	Negligible
R5	20.43	0.004	20.43	0.04	Negligible
R11	22.15	0.021	22.17	0.21	Negligible
R12	21.73	0.025	21.76	0.25	Negligible
R14	22.70	0.007	22.71	0.07	Negligible
R15	22.31	0.017	22.33	0.17	Negligible
R16	21.45	0.004	21.45	0.04	Negligible
R17	21.23	0.003	21.23	0.03	Negligible
R18	22.04	0.038	22.07	0.38	Negligible
R21	22.06	0.036	22.09	0.36	Negligible
R22	23.49	0.006	23.50	0.06	Negligible

Table A6.2.1 shows that the routine testing and maintenance of UP4 is proposed to have a Negligible impact on annual mean NO_2 concentrations at sensitive receptors, even when assessed against the 10 µg.m^{-3} threshold. All receptors are predicted to exceed the threshold by over 200%, but this exceedance is caused almost exclusively by existing baseline air quality conditions.

Table A6.2.2 shows that a 24-hour power outage at UP4 could lead to one Moderately Adverse impact at Receptor R3. This impact is attributable to existing high baseline concentrations, rather than due to UP4 causing large increases in annual mean NO_2 concentrations. With this in mind, and noting that the impact is only predicted to occur at Receptor R3, it is considered reasonable to suggest that the Proposed Development is not causing a significantly adverse air quality impact, overall.

All predicted total concentrations, in both scenarios, are at least 41% below the legally binding annual mean AQS for NO_2.

Appendix 6.3: Modelling Inputs

Dispersion Modelling

Dispersion modelling was undertaken using ADMS-6 (version 6.0.0.1), which is produced by Cambridge Environmental Research Consultants (CERC). ADMS-6 is a Defra-approved short-range dispersion model that simulates a wide range of buoyant and passive releases to the atmosphere. It is a 'new generation' dispersion model, which uses a skewed gaussian concentration distribution to calculate dispersion under convective conditions.

Modelled Buildings

Buildings can have significant effects on the dispersion of pollutants and can increase ground level concentrations. The proposed Energy Centre and Data Centre buildings at the application site were included in the model, so building downwash effects could be considered. All other Data Centre and Energy Centre buildings of sufficient height on the Union Park campus were also included. Table A6.3.1 below provides details of the modelled buildings.

Table A6.3.1 Modelled Buildings

Building	Centroid		Height (m)	Length(m)	Width(m)	Angle(degrees)
	X	Y				
Energy Centre 1	510401.2	179263.7	21.1	76	24	90
Energy Centre 2	510494.6	179264.8	21.1	70	24	90
Energy Centre 3	510447.6	179211.4	21.1	56	32	90
Energy Centre 4	510242.0	179351.0	28.0	55	33	90
Data Centre 1	510519.1	179329.1	32.5	74	78	90
Data Centre 2	510448.3	179324.2	34.3	70	78	90
Data Centre 3	510375.2	179333.8	34.3	77	78	90
Data Centre 4	510303.0	179335.0	34.3	66	68	90

Modelled Stacks

The generator stacks for all modelled Data Centres/ Energy Centres are listed in Table A6.3.2 below.

Table A6.3.2 Modelled Stacks

Generator Stack ID	UK Grid Coordinates		Height (m)	Angle of Stack at Release
	X	Y		
EC4 1	510234.5	179364.8	28	Vertical
EC4 2	510234.5	179362.8	28	Vertical
EC4 3	510234.5	179359.8	28	Vertical
EC4 4	510234.5	179357.8	28	Vertical
EC4 5	510234.5	179352.2	28	Vertical
EC4 6	510234.5	179350.59	28	Vertical
EC4 7	510239.5	179349.8	28	Vertical

EC4 8	510242	179349.8	28	Vertical
EC4 9	510245.41	179349.8	28	Vertical
EC4 10	510247.41	179349.8	28	Vertical
EC4 11	510252.59	179349.8	28	Vertical
EC4 12	510254.59	179349.8	28	Vertical
EC4 13	510258.41	179349.8	28	Vertical
EC4 14	510260.41	179349.8	28	Vertical
EC3 1	510406.94	179255.86	21.1	Vertical
EC3 2	510410.66	179255.78	21.1	Vertical
EC3 3	510413.88	179255.86	21.1	Vertical
EC3 4	510416.88	179255.86	21.1	Vertical
EC3 5	510420.09	179255.95	21.1	Vertical
EC3 6	510423.31	179255.86	21.1	Vertical
EC3 7	510426.69	179255.95	21.1	Vertical
EC3 8	510403.44	179255.78	21.1	Vertical
EC3 9	510399.81	179255.58	21.1	Vertical
EC3 10	510396.31	179255.78	21.1	Vertical
EC3 11	510392.66	179255.78	21.1	Vertical
EC3 12	510429.91	179255.95	21.1	Vertical
EC3 13	510389.19	179255.95	21.1	Vertical
EC3 14	510433.41	179255.95	21.1	Vertical
EC2 1	510443.25	179202.77	21.1	Vertical
EC2 2	510423.56	179202.77	21.1	Vertical
EC2 3	510468.28	179202.77	21.1	Vertical
EC2 4	510426.44	179202.77	21.1	Vertical
EC2 5	510429.75	179202.77	21.1	Vertical
EC2 6	510433.25	179202.77	21.1	Vertical
EC2 7	510436.28	179202.77	21.1	Vertical
EC2 8	510439.69	179202.77	21.1	Vertical
EC2 9	510465.22	179202.77	21.1	Vertical
EC2 10	510461.59	179202.77	21.1	Vertical
EC2 11	510458.03	179202.77	21.1	Vertical
EC2 12	510454.44	179202.77	21.1	Vertical
EC2 13	510450.38	179202.77	21.1	Vertical
EC2 14	510446.66	179202.77	21.1	Vertical
EC1 1	510521.47	179257.05	21.1	Vertical
EC1 2	510520.19	179256.91	21.1	Vertical
EC1 3	510511.47	179256.84	21.1	Vertical
EC1 4	510510.22	179256.84	21.1	Vertical
EC1 5	510508.72	179256.84	21.1	Vertical
EC1 6	510507.56	179256.75	21.1	Vertical
EC1 7	510481.53	179256.5	21.1	Vertical
EC1 8	510480.25	179256.5	21.1	Vertical
EC1 9	510478.62	179256.45	21.1	Vertical
EC1 10	510477.5	179256.41	21.1	Vertical
EC1 11	510468.5	179256.28	21.1	Vertical
EC1 12	510467.31	179256.31	21.1	Vertical
EC1 13	510465.72	179256.31	21.1	Vertical
EC1 14	510464.34	179256.28	21.1	Vertical

Generator Emissions

The key pollutant emissions associated with the standby generators are NO_2/NO_X, PM_{10} and $PM_{2.5}$.

The assessment was carried out assuming that the fuel type for all generators would be diesel, despite the understanding that the generators will likely run on hydrotreated vegetable oil (HVO). Emissions from diesel generators are generally higher than when using HVO for PM and NO_X and as such, this is a conservative approach.

The emission parameters of the standby generators (e.g. volumetric flow rate, exhaust temperature) were derived from the manufacturers' datasheets for generator type: 20V4000G94LF, which is provided in this Appendix. During the commissioning of the EC1 generators, the EA's Operating Permit and LBH's Planning Conditions 22, 23, 24 and 25 (associated with permission 75111/APP/2023/3119) required the developer to undertake emissions monitoring. The monitoring was witnessed by the EA and the reports have been issued, showing that emissions during generator operation are as designed; this validates the modelling assumptions applied to this and previous air quality assessments. Planning Conditions 22, 23, 24 and 25 were discharged on this basis.

During the planning process for the three energy centres which received planning permission in 2022 (Planning Reference: 75111/APP/2022), LBH required that abatement be implemented for the proposed generators to achieve a NO_X emissions limit of 95 $mg.Nm^{-3}$ (at 5% O_2). In response to that planning requirement, the operator made significant investment in NO_X abatement technology in the form of Selective Catalytic Reduction (SCR) to achieve the limit imposed by LBH. SCR will also be introduced for this proposed development, with NO_X emissions achieving the same 95 $mg.Nm^{-3}$ (at 5% O_2) limit. The manufacturer has warranted that an emission concentration of 95 mg $NO_X.Nm^{-3}$ (5% O_2) shall be achieved, and this was demonstrated during the emissions monitoring of EC1 during commissioning, as witnessed by the EA.

As the SCR system is only effective after temperatures reach 280°C, there is a period after start-up when emissions from the generators would be unabated. It is a requirement under Environmental Permitting that this period lasts for no longer than 20 mins. The manufacturer has suggested that with load steps (i.e. running generators at higher loads initially), the SCR system could warm-up in fewer than 15 minutes. For conservative purposes, all generators were assumed to run for 20 minutes unabated, regardless of the loads the generators are run at. The same approach was taken for the adjacent data centre planning application (Ref: 75111/APP/2022).

A summary of the emission parameters for the 14 No. generators is provided in Table 4.1, below. The same generator is/will be used at all four sites.

Table 4.1: Model Inputs for Generators

Parameter	Unit	Data per generator at 100% Load	Data per generator at 75% Load	Data per generator at 25% load	Data per generator at 10% Load
Power	kW	3307	2480	827	331
Stack(s) diameter	m	0.7	0.7	0.7	0.7

Parameter	Unit	Data per generator at 100% Load	Data per generator at 75% Load	Data per generator at 25% load	Data per generator at 10% Load
Exhaust gas temperature	ºC	482	427	403	268
Exhaust volumetric flow (actual)	$m^3.s^{-1}$	11.90	7.83	3.69	2.12
Exhaust volumetric flow (dry, 5% O_2)	$Nm^3.s^{-1}$	2.57	1.87	0.74	0.35
NO_X emission rate*	$g.s^{-1}$	6.063	4.064	1.011	0.837
NO_X emission rate (concentration post SCR not to exceed 95 $mg.Nm^{-3}$ (5% O_2))	$g.s^{-1}$	0.244	0.178	0.070	0.033
PM_{10} and $PM_{2.5}$ emission rate**	$g.s^{-1}$	0.018	0.021	0.041	0.005

* Values based on unabated concentrations of 2362 $mg.Nm^{-3}$ (at 100% load), 2172 $mg.Nm^{-3}$ (at 75% load), 1375 $mg.Nm^{-3}$ (at 25% load) and 2411 $mg.Nm^{-3}$ (at 10% load).

** All PM is assumed to emit fully as both PM_{10} and $PM_{2.5}$, for conservatism.

Specifications for *MTU 20V4000 G94LF*

Revision *Change index*					

Motordaten
engine data

	Genset	Marine	O & G	Rail	C & I
Application	x				
Engine model	20V4000G94LF				
Application group	3D				
Emission Stage/Optimisation	NEA Singapore for ORDE				
Test cycle	D2				
fuel sulphur content [ppm]	7				
mg/mN³ values base on residual oxygen value of [%]	measured				

Motor Rohemissionen*
*Engine raw emissions**

Cycle point	[-]	n1	n2	n3	n4	n5	n6	n7	n8
Power (P/PN)	[-]	1	0,75	0,50	0,25	0,10			
Power	[kW]	3307	2480	1653	827	331			
Speed (n/nN)	[-]	1	1	1	1	1			
Speed	[rpm]	1500	1499	1499	1500	1499			
Exhaust temperature after turbine	[°C]	482	427	434	403	268			
Exhaust massflow	[kg/h]	19196	15930	12083	7485	5323			
Exhaust back pressure (total)	[mbar]	52	32	14	5	0			
NOx	[g/kWh]	6,6	5,9	4,8	4,4	9,1			
	[mg/mN³]	1641	1326	930	676	776			
CO	[g/kWh]	0,3	0,4	1,0	1,4	2,8			
	[mg/mN³]	77	85	192	219	233			
HC	[g/kWh]	0,05	0,07	0,09	0,16	0,72			
	[mg/mN³]	13	14	16	25	60			
O2	[%]	9,9	11,2	11,9	13,1	15,8			
Particulate measured	[g/kWh]	0,02	0,03	0,10	0,18	0,05			
	[mg/mN³]	5	6	19	27	4			
Particulate calculated	[g/kWh]	-	-	-	-	-			
	[mg/mN³]	-	-	-	-	-			
Dust (only TA-Luft)	[mg/mN³]	-	-	-	-	-			
FSN	[-]	0,2	0,2	0,6	1,0	0,1			
NO/NO2**	[-]	-	-	-	-	-			
CO2	[g/kWh]	645,7	632,1	669,3	721,6	844,5			
	[mg/mN³]	155278	136196	126261	109200	70577			
SO2	[g/kWh]	0,003	0,003	0,003	0,003	0,004			
	[mg/mN³]	0,7	0,6	0,6	0,5	0,3			

* Emission data measurement procedures are consistent with the respective emission evaluation process. Noncertified engines are measured to sales data (TVU/TEN) standard conditions.
These boundary conditions might not be representative for detailed dimensioning of exhaust gas aftertreatment, in this case it is recommended to contact the responsible department for more information.
Measurements are subject to variation. The nominal emission data shown is subject to instrumentation, measurement, facility, and engine-to-engine variations.
All data applies to an engine in new condition. Over extended operating time deterioration may occur which might have an impact on emission.
Exhaust temperature depends on engine ambient conditions.

** No standard test. To be measured on demand.

Aenderungsbeschreibung/Description of Revision	Kommt von/Frequency
Angabe Sauerstoffgehalt im Abgas bei Bezug auf 5% angepasst	

MTU Friedrichshafen GmbH

	WORD	Datum/ Date	Name
Erstell.	Drawn	20.09.2017 09:35:43	zwisler
Aenderg.	Change	20.09.2017 13:37:26	zwisler
Inhalt	Content	10.04.2017	Locher
Gepr.	Checked	20.09.2017	Kneifel

Motortyp / Engine Type: **20V4000G94LF**

Projekt-/Auftrags-Nr. / Project/Order No.
Verwendbar f.Typ / Applicable to Model
Format/Size: **A3**
Material-Nr./Material No.: **EDS 4000 1162**
Benennung/ Title: **Emissionsdatenblatt**
Emission Data Sheet

Zeichnungs-Nr./Drawing No.: **ZNG00005084**

Buchst./Rev. Ltr.	Aenderungs-Nr./Revision Notice No.	Bearbeitungsstatus/Lifecycle
b.1		in Arbeit

Beschreibung/Description

Blatt/ Sheet **2** von/of **6**

Motordaten
engine data

	Genset	Marine	O & G	Rail	C & I
Application	X				
Engine model	20V4000G94LF				
Application group	3D				
Emission Stage/Optimisation	NEA Singapore for ORDE				
Test cycle	D2				
fuel sulphur content [ppm]	7				
mg/mN³ values base on residual oxygen value of [%]	5				

Motor Rohemissionen*
*Engine raw emissions**

Cycle point	[-]	n1	n2	n3	n4	n5	n6	n7	n8
Power (P/PN)	[-]	1	0,75	0,50	0,25	0,10			
Power	[kW]	3307	2480	1653	827	331			
Speed (n/nN)	[-]	1	1	1	1	1			
Speed	[rpm]	1500	1499	1499	1500	1499			
Exhaust temperature after turbine	[°C]	482	427	434	403	268			
Exhaust massflow	[kg/h]	19196	15930	12083	7485	5323			
Exhaust back pressure (total)	[mbar]	52	32	14	5	0			
NOx	[g/kWh]	6,6	5,9	4,8	4,4	9,1			
	[mg/mN³]	2362	2172	1639	1375	2411			
CO	[g/kWh]	0,3	0,4	1,0	1,4	2,8			
	[mg/mN³]	111	139	339	445	723			
HC	[g/kWh]	0,05	0,07	0,09	0,16	0,72			
	[mg/mN³]	19	23	29	50	187			
O2	[%]	5,0	5,0	5,0	5,0	5,0			
Particulate measured	[g/kWh]	0,02	0,03	0,10	0,18	0,05			
	[mg/mN³]	7	10	33	55	13			
Particulate calculated	[g/kWh]	-	-	-	-	-			
	[mg/mN³]	-	-	-	-	-			
Dust (only TA-Luft)	[mg/mN³]	-	-	-	-	-			
FSN	[-]	0,2	0,2	0,6	1,0	0,1			
NO/NO2**	[-]	-	-	-	-	-			
CO2	[g/kWh]	645,7	632,1	669,3	721,6	844,5			
	[mg/mN³]	223605	223061	222522	222035	219215			
SO2	[g/kWh]	0,003	0,003	0,003	0,003	0,004			
	[mg/mN³]	1,0	1,0	1,0	1,0	1,0			

* Emission data measurement procedures are consistent with the respective emission evaluation process. Noncertified engines are measured to sales data (TVU/TEN) standard conditions.
These boundary conditions might not be representative for detailed dimensioning of exhaust gas aftertreatment, in this case it is recommended to contact the responsible department for more information.
Measurements are subject to variation. The nominal emission data shown is subject to instrumentation, measurement, facility, and engine-to-engine variations.
All data applies to an engine in new condition. Over extended operating time deterioration may occur which might have an impact on emission.
Exhaust temperature depends on engine ambient conditions.

** No standard test. To be measured on demand.

MTU Friedrichshafen GmbH

	WORD	Datum/ Date	Name
Erstellt. Drawn		20.09.2017 09:39:43	zwislers
Bearb. Change		20.09.2017 13:37:26	zwislers
Inhalt Content		10.04.2017	Locher
Gepr. Checked		20.09.2017	Knelfel

Projekt/Auftrags-Nr. Project/Order No.
Verwendbar f.T.yp Applicable to Model
Format/Size A3
Material-Nr./Material No. EDS 4000 1162
Benennung/ Title
Emissionsdatenblatt
Emission Data Sheet
Motortyp / Engine Type **20V4000G94LF**
Zeichnungs-Nr./Drawing No. **ZNG00005084**
Blatt/ Sheet 5 von/of 6
Beschreibung/Description

Änderungsbeschreibung/Description of Revision	Kommt von/Frequency
Angabe Dauerstoffgehalt im Abgas bei Bezug auf 5% angepasst	

Buchst./Rev. Ltr.	Änderungs-Nr./Revision Notice No.	Bearbeitungsstatus/Lifecycle
b.1		In Arbeit

Pos. 2	CATALYST	SCR-700/1-A-S816.45-50-A48.7,5-10-DK

general data

Engine:	MTU 20V4000G94LF	
Fuel:	Diesel	
Operation of engine:	λ > 1	
Exhaust gas mass flow:	19196	kg/h
Exhaust gas temperature:	475	°C
Maximum Exhaust gas temperature:	505	°C
Maximum Exhaust gas pressure:	0,1	barg
Pressure Los (total):	**45**	**mbar**
Urea consumption (32,5%):	appr. 52,3	L/h
Urea consumption (32,5%):	appr. 10 at 200h	m³/a
sound pressure level at SCR inlet *	**91 @ 1 m**	**dB(A)**
sound pressure level after SCR *	**70 @ 1 m**	**dB(A)**

*only achieved when honeycombs are built in the SCR.

Emissions [5% O2]

	Before Catalytic Converter	After Catalytic Converter	
CO	< 111	< 111	mg/Nm³
NOx	< 2362	< 95	mg/Nm³
CH_2O	< 19	< 19	mg/Nm³
NH_3		< 5	mg/Nm³

Equipment SCR

SCR

Number of rows SCR	5	pc.
Number of empty rows	0	pc.

Oxi

Number of rows Oxi	1	pc.
Number of empty rows	0	pc.

Material

Material injection	Stainless steel
Material flanges injection	Stainless steel
Material housing	Steel
Material flanges housing	Steel

Installation and connection

Place of installation	Inside installation; no ex zone Outdoor installation by arrangement	
Min. ambient temperature	5	°C
Max. ambient temperature	40	°C
Exhaustgas piping inlet	700/10	DN/PN
Exhaustgas piping outlet	800/10	DN/PN

Appendix 6.4: Air Quality Damage Costs

As discussed in ES Chapter 6 – Air Quality, the Proposed Development is required to actively contribute towards the improvement of local air quality. To achieve this, LBH has requested that an air quality damage cost calculation be undertaken to estimate the impact that emissions associated with the proposed development will have on society (e.g. adverse health outcomes). The calculated costs could then be secured via an S106 agreement, and it is expected that all funds would be spent by LBH on the improvement of local air quality.

The latest Defra guidance[8] advocates that a development's damage cost should be derived from estimates of changes in emissions of NO_X and $PM_{2.5}$, over an appropriate appraisal period. Whilst it is common practice for appraisal periods to be 5 years, LBH requested a ten-year appraisal period for transport emissions for the permitted adjacent data centres (Ref: 75111/APP/2022/1007), so it is considered appropriate to assess a 10-year period in this instance. Changes in transport and energy centre emissions were considered, and the full calculation is set out in this Appendix.

The total annual building emissions from the development have been calculated based on the realistic testing schedules (+1.1% for likely additional maintenance activities), plus a 2-hour grid failure each year for the full appraisal period, as requested by LBH. The appraisal period for building emissions is 30 years, again in line with LBH's requirements of the adjacent permitted data centres.

Transport Emissions

To evaluate the scale of a proposed development's total emissions, Defra recommends an emissions cost calculation using the following formula:

Road Transport Emission Increase (Cost, £) =

Estimated trip rate for 5 years × Emission Rate/10km/vehicle type × Damage Costs

The latest Defra guidance[8] and Emissions Factor Toolkit[9] were used to determine total transport related emissions that would be generated by the proposed development; the inputs used in the calculation are shown in Table A6.4.1.

[8] Defra. (2023). Air Quality Appraisal: damage cost guidance. Available at https://www.gov.uk/government/publications/assess-the-impact-of-air-quality/air-quality-appraisal-damage-cost-guidance

[9] Defra. (2025). Emissions Factor Toolkit v13.

Table A6.4.1: Transport Emission Calculation Inputs

Input	Value	Unit	Source/guidance
Trip Length	10	km	Defra
Development Traffic Flow	52	AADT	Transport Consultant
EFT Road Type	London (Outer)	-	EFT
EFT Year	2026-2035	-	In line with EFT estimates
Average Speed	50	$km.hr^{-1}$	Defra
Appraisal period	10	years	LBH Request

The total emission 'damage' cost was calculated using Defra's appraisal toolkit and is presented in Tables A6.4.2 and A6.4.3.

The calculation accounts for an 'uplift factor' of 1.5% cumulatively per annum and a 'discount rate'. Central estimate damage costs for 'Road Transport Outer London' were based on Defra 2025 prices.

Table A6.4.2: Emission Cost Calculation for NO_x.

	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
NO_X increase (tonnes)	0.0156	0.0123	0.0103	0.0084	0.0069	0.0057	0.0047	0.0034	0.0029	0.0025
Central Damage cost (£)	35,066	35,066	35,066	35,066	35,066	35,066	35,066	35,066	35,066	35,066
Adjusted Damage cost (£)	545	427	349	281	228	186	150	108	92	77
Total	**£2,444**									

Table A6.4.3: Emission Cost Calculation for $PM_{2.5}$.

	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
$PM_{2.5}$ increase (tonnes)	0.0032	0.0032	0.0031	0.0031	0.0030	0.0030	0.0030	0.0029	0.0029	0.0029
Central Damage cost (£)	261893	261893	261893	261893	261893	261893	261893	261893	261893	261893
Adjusted Damage cost (£)	841	816	793	770	749	729	710	692	675	658
Total	**£7,433**									

Total transport-related damage costs are summarised as follows:

NO_X emission 'damage' (cost, £) = £2,444 +

$PM_{2.5}$ emission 'damage' (cost, £) = £7,433

TOTAL (cost, £) = £9,877

Standby Generator Emissions

To evaluate the scale of the Proposed Development's standby generator emissions, the estimated annual emissions from the generators, inclusive of an unlikely 2-hour grid failure, were multiplied by Defra's Damage Costs over a 30-year appraisal period, starting in 2026. The selected pollutant sector was '*Part A Category 3*'.

Details of the generator emissions used for the calculation are provided below in Table A6.4.4.

Table A6.4.4: Generator Emission Calculation Inputs

Parameter	Monthly Testing	Quarterly Testing	Annual Testing	Grid Failure
Fuel Type[a]	Diesel	Diesel	Diesel	Diesel
No. of Generators	14	14	14	12
Engine Load (%)	10%	75%	100%	100%
Unabated NOx emission rate (g/s)	0.837	4.064	6.063	6.063
NOx emission rate with SCR (g/s)	0.033	0.178	0.244	0.244
PM2.5 emission rate (g/s)[b]	0.005	0.021	0.018	0.018
Duration of each test +1.1% (hrs) [c]	0.253	1.011	2.022	2.022
Hours of operation per annum +1.1% (hrs)[c]	2.022	3.033	2.022	2.022
Total NO_x emissions (g/annum)[d]	85266.5	73545.4	36200.3	31028.8
Total NO_x emissions (tonnes/annum)	0.08527	0.07355	0.03620	0.03101
Total NO_x emissions on HVO Fuel (tonnes/annum)[e]	**0.07802**	**0.06729**	**0.03312**	**0.02839**
Total $PM_{2.5}$ emissions (g/annum)	468.497	3159.173	1872.291	1604.821
Total $PM_{2.5}$ emissions (tonnes/annum)	0.0004685	0.0031592	0.0018723	0.0016048
Total $PM_{2.5}$ emissions on HVO Fuel (tonnes/annum)[e]	**0.0004006**	**0.0027011**	**0.0016008**	**0.0013721**

Notes:

a) all generators are anticipated to run on Hydrotreated Vegetable Oil (HVO) fuel

b) assumes 100% of all PM emitted from the generators is $PM_{2.5}$, which is extremely conservative

c) planned annual maintenance was recorded by the Applicant to take on average 1.1% longer than anticipated due to problems identified during testing, so all test durations account for this additional period

d) assumes emissions will be unabated for the first 20 minutes of each test, which is 5 minutes longer than is realistically anticipated

e) For the adjacent permitted Data Centres (App Ref: 75111/APP/2022), LBH agreed that HVO fuels would reduce NO_X emissions by 8.5% and $PM_{2.5}$ emissions by 14.5%, compared with diesel.

The results in Table A6.4.4 can be added together to provide total UP4 emission rates, in tonnes/ annum (assuming use of HVO):

Total UP4 Generator NO_X emissions = 0.207 tonnes.annum^{-1}

Total UP4 Generator $PM_{2.5}$ emissions = 0.00607 tonnes.annum^{-1}

Using Defra's Damage Cost Appraisal Toolkit, NO_X Central Damage Costs are at £8,980 per tonne of pollutant and the Central Benefits are £1,857 (discounted by 1.5% per annum). $PM_{2.5}$ Central Damage Costs are at £164,911 and the Central Benefits are £1,002 (discounted by 2% per annum). The resultant Damage Costs (Central Present Values) over a 30-year period are presented below:

NO_X emission 'damage' (cost, £) = £45,272 +

$PM_{2.5}$ emission 'damage' (cost, £) = £24,419

TOTAL (cost, £) = £69,691

Appendix 6.5: Demolition & Construction Mitigation

The Greater London Authority's *Control of Dust and Emissions Supplementary Planning Guidance*[10] (SPG) suggests a number of mitigation measures that should be adopted in order to minimise impacts from emissions of dust and fine particles. Appropriate measures that could be adopted during construction of the proposed development include:

- ideally cutting, grinding and sawing should not be conducted on-site and pre-fabricated material and modules should be brought in where possible;
- where such work must take place, water suppression should be used to reduce the amount of dust generated;
- skips, chutes and conveyors should be completely covered and, if necessary, enclosed to ensure that dust does not escape;
- no burning of any materials should be permitted on site;
- any excess material should be reused or recycled on-site in accordance with appropriate legislation;
- developers should produce a waste or recycling plan;
- following earthworks, exposed areas and soil stockpiles should be re-vegetated to stabilise surfaces, or otherwise covered with hessian or mulches;
- stockpiles should be stored in enclosed or bunded containers or silos and kept damp where necessary;
- hard surfaces should be used for haul routes where possible;
- haul routes should be swept/washed regularly;
- vehicle wheels should be washed on leaving the site;
- all vehicles carrying dusty materials should be securely covered; and
- delivery areas, stockpiles and particularly dusty items of construction plant should be kept as far away from neighbouring properties as possible.

10 Greater London Authority. (2014). *The Control of Dust and Emissions During Construction and Demolition Supplementary Planning Guidance.*

In addition, the IAQM's latest *Guidance on the assessment of dust from demolition and construction*[11] recommends mitigation measures for *Low, Medium* and *High* Dust Impact Risk Sites. The IAQM's recommended mitigation measures for *Medium Risk* sites have been provided below. Where mitigation measures relate to a specific construction stage, these have been tailored to reflect the dust impact risk determined (i.e. *Medium Risk* for demolition and construction and *Low Risk* for earthworks and trackout activities), as presented in Table 6.17 in ES Chapter 6.

Please refer to the IAQM's latest construction dust guidance[11] and *Guidance on Air Quality Monitoring in the Vicinity of Demolition and Construction Sites*[12] for further mitigation measures.

Communications

- Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.
- Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager.
- Display the head or regional office contact information.
- Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. The level of detail will depend on the risk, and should include as a minimum the highly recommended measures in this Appendix. The DMP may include monitoring of dust deposition, dust flux, real-time PM_{10} continuous monitoring and/or visual inspections.

Site Management

- Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.
- Make the complaints log available to the local authority when asked.
- Record any exception incidents that cause dust and/or air emissions, either on- or off-site, and the action taken to resolve the situation in the log book.

Monitoring

- Carry out regular site inspections to monitor compliance with the Dust Management Plan, record inspection results, and make an inspection log available to the local authority when asked.

11 Institute of Air Quality Management. (2024). *Guidance on the assessment of dust from demolition and construction.* (Version 2.2).
12 Institute of Air Quality Management. (2018). Guidance on Air Quality Monitoring in the Vicinity of Demolition and Construction Sites.

- Increase the frequency of inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
- Agree dust deposition, dust flux, or real-time PM_{10} continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if it is a large site, before work on a phase commences. Further guidance is provided by the IAQM in monitoring during demolition, earthworks and construction.

Preparing and Maintaining the Site

- Plan site layout so that machinery and dust causing activities are located away from receptors, as far as possible.
- Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.
- Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period.
- Avoid site runoff of water or mud.
- Keep site fencing, barriers and scaffolding clean using wet methods.
- Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on site cover as described below.
- Cover, seed or fence stockpiles to prevent wind whipping.

Operating Vehicle / Machinery and Sustainable Travel

- Ensure all on-road vehicles comply with the requirements of the London Ultra Low Emission Zone and that all non-road mobile machinery (NRMM) comply with the London NRMM standards, where applicable. Details of the NRMM requirements specific to this site are discussed in Appendix 9.1 and re-listed below:
    - NRMM operating on site during the construction of the proposed development will meet stage IV of EU Directive 97/68/EC as a minimum.
    - Furthermore, all constant speed engines such as those typically found in generators will be required to meet Stage V.
- Ensure all vehicles switch off engines when stationary – no idling vehicles.
- Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where practicable.

Operations

- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.

- Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
- Use enclosed chutes and conveyors and covered skips.
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on equipment wherever appropriate.
- Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.

Waste Management

- Avoid bonfires and burning of waste materials.

Demolition

- Ensure effective water suppression is used during demolition operations. Hand held sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground.
- Avoid explosive blasting, using appropriate manual or mechanical alternatives.
- Bag and remove any biological debris or damp down such material before demolition.

Construction

- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.

Where dust generation cannot be avoided in areas close to neighbouring properties, additional mitigation measures should be put in place, such as: windbreaks, sprinklers, and / or time / weather condition limits on the operation of some items of plant or the carrying out of activities that are likely to generate a particularly significant amount of dust.

After the implementation of the mitigation measures listed within this Appendix, the significance of each phase of the construction programme will be reduced and the residual significance of impact for the demolition and construction phase is expected to be *Negligible*.

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