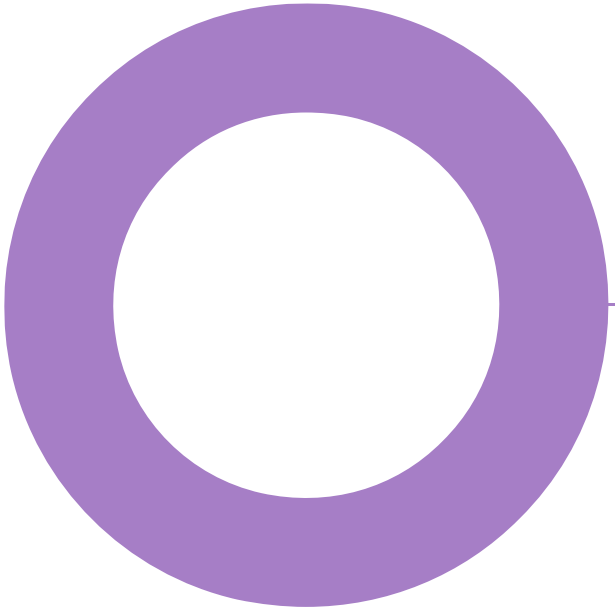
HOARE LEA

Harefield Hospital Substation 2 & 3. Harefield.

Royal Brompton & Harefield Hospitals.

AIR QUALITY
AIR QUALITY ASSESSMENT

REVISION 01 – 11 SEPTEMBER 2025



Audit sheet.

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Contents.

Executive summary.

Hoare Lea have been commissioned by Montagu Evans on behalf of Royal Brompton & Harefield Hospitals to undertake an Air Quality Assessment to support the planning application for the proposed generator installation as part of the Guys and St Thomas' NHS Foundation Trust at Harefield Hospital, Hill End Road, Harefield, UB9 6JH (the 'Site').

The proposals comprise the installation of two diesel generators with a standby power rating of 1217 kW each, to provide resilience to substations 2 & 3 (hereafter referred to as the 'Proposed Combustion Plant'). These generators will provide back-up power for life-safety for Harefield Hospital.

The baseline assessment has shown that the Site is not located within an Air Quality Management Area (AQMA). The closest passive diffusion tube monitoring location to the Site did not record any exceedances of the annual mean nitrogen dioxide (NO_2) Air Quality Objective (AQO), the indicative 1-hour mean NO_2 AQO level, or the relevant World Health Organisation (WHO) guidelines in the last five years of monitoring data. There is no particulate matter (PM_{10} & $PM_{2.5}$) monitoring in the vicinity of the Site.

The anticipated emissions from the Proposed Combustion Plant have been modelled using the dispersion model ADMS 6 and the potential impacts on local NO_2 concentrations have been assessed in line with both the Defra and Environment Agency (EA) online guidance and the Environmental Protection UK (EPUK) and Institute of Air Quality Management (IAQM) planning guidance. Concentrations associated with the generators emissions have been predicted based on a monthly testing schedule of three hours per month, testing one generator for the full three hours, alternating each month at 100% load.

The impacts on the annual mean NO_2 AQO, the 1-hour mean NO_2 AQO and the annual mean PM_{10} AQO at existing sensitive receptors are predicted to be not significant in line with the EPUK and IAQM guidance. As such, no additional mitigation measures are required for the Proposed Combustion Plant in regards to air quality.

Based on the assessment results, it is considered that air quality should not be viewed as a constraint to planning and the Proposed Development conforms to the principles of National Planning Policy Framework, the London Plan and the Hillingdon Local Plan.

1. Introduction.

Hoare Lea have been commissioned by Montagu Evans on behalf of Royal Brompton & Harefield Hospitals to undertake an Air Quality Assessment to support the planning application for the proposed generator installation at Harefield Hospital, Hill End Road, Harefield, UB9 6JH (the 'Site').

1.1 Proposed development.

The proposals comprise the installation of two diesel generators with a standby power rating of 1,217 kW each, to provide resilience to substations 2 & 3 (hereafter referred to as the 'Proposed Combustion Plant'). The purpose of the Proposed Combustion Plant is to provide back-up and life-safety power for Harefield Hospital.

1.2 Site description and location.

The Site is located within London Borough of Hillingdon (LBH) administrative area at the approximate National Grid Reference (NGR): X 505250 Y 190740. The Site is currently undeveloped land within the hospital grounds.

Figure 1 illustrates the location of the proposed generators.

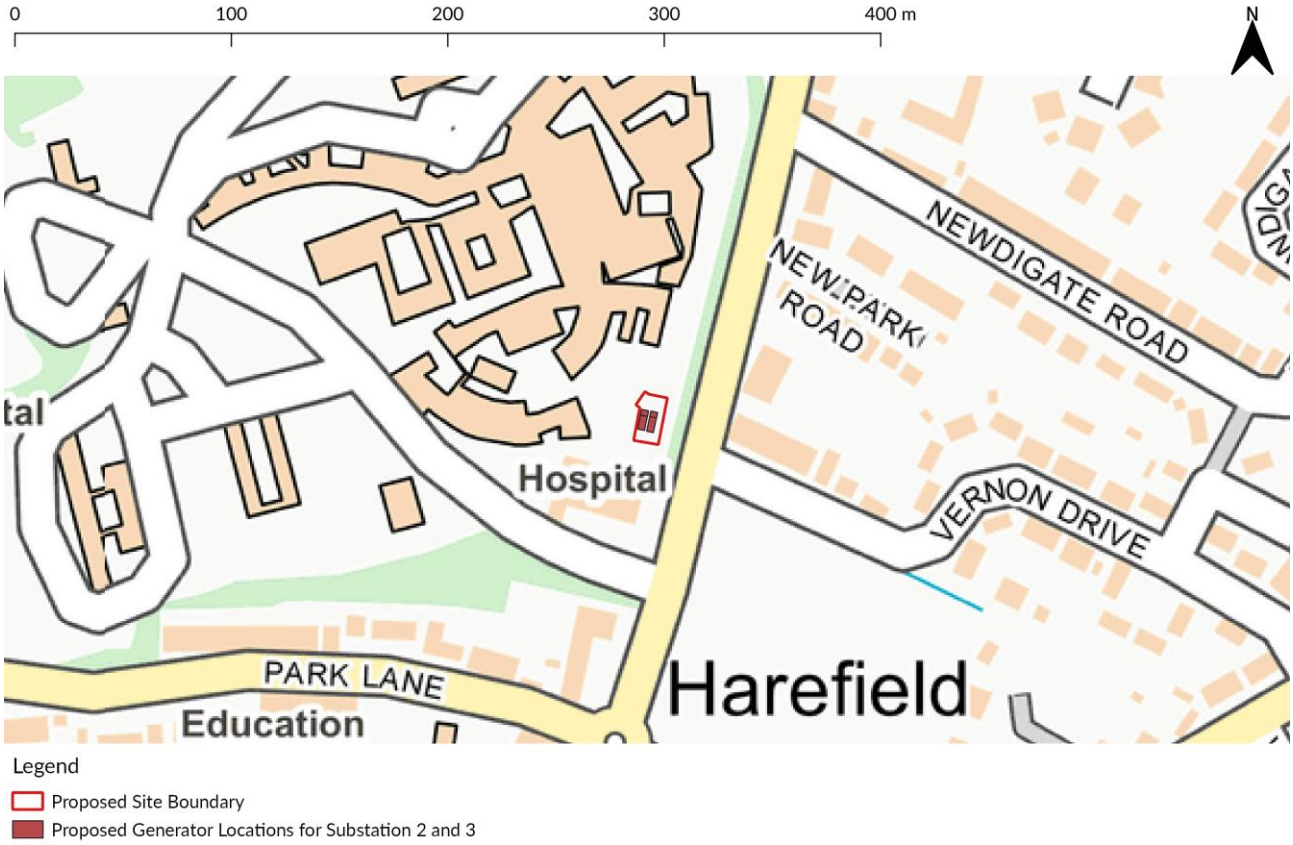

Figure 1: Approximate location of the proposed generators. Contains OS Data © Crown Copyright and Database rights 2025.

2. Legislation, policy and guidance documents.

2.1 Legislation

The following legislation has informed this Air Quality Assessment and is detailed further in Appendix 1:

- The Environment Act [1,2].
- The Air Quality Strategy[3].
- The Air Quality (England) Regulations 2000[4].
- The Air Quality (England) (Amendment) Regulations 2002[5].
- The Air Quality Standards Regulations 2010[6].
- The Air Quality Standards (Amendment) Regulations 2016[7].
- The Environmental Improvement Plan[8].
- Part III of the Environmental Protection Act (EPA) 1990 (as amended)[9].
- The Clean Air Strategy (CAS)[10].

2.2 Policy

The following policy has informed this Air Quality Assessment and is detailed further in the Appendix 1:

- The National Planning Policy Framework (NPPF) 2024[11].
- The Planning Practice Guidance (PPG)[12].
- The London Plan 2021[13].
- The London Environment Strategy (LES) 2018[14].
- The Hillingdon Local Plan[15].

2.3 Guidance

The following guidance has informed this Air Quality Assessment and is detailed further in the Appendix 1:

- Defra's Local Air Quality Management Technical Guidance[16]. This guidance will be referred to as 'LAQM.TG(22)' throughout this report.
- The Mayor of London's 'London Local Air Quality Management Technical Guidance'[17]. This guidance will be referred to as 'LLAQM.TG(19)' throughout this report.
- The Environmental Protection UK (EPUK) and the Institute of Air Quality Management's (IAQM) Air Quality Guidance for Planning[18]. This guidance will be referred to as 'EPUK and IAQM planning guidance' throughout this report.
- Defra Interim Planning Guidance[19].
- The Environment Agency's (EA) 'Medium Combustion Plant Directive' (MCPD)[20].
- The EA's Emergency backup diesel engines on installations: best available techniques (BAT)[21].
- The EA's Environmental Permitting: Air Dispersion Modelling Reports Guidance[22]

2.4 Local Policy and guidance

In addition to the documents outlined in the previous sections above, Table 1 contains a summary of the local Policy and Guidance which are relevant to this assessment.

Table 1: Local Policy and Guidance Documents

Local policy and guidance document	Summary notes
Hillingdon Local Plan Part 1	The Hillingdon Local Plan Part 1, prepared by the LBH, was adopted in 2012 and covers the period up to 2026. The local plan sets out the planning policies and allocations for growth and regeneration within the administrative area. A review of the Local Plan indicates the following policy relevant to this assessment: - EM8: Land, Water, Air and Noise
Hillingdon Local Plan Part 2	The Hillingdon Local Plan Part 2, prepared by the LBH, was adopted in 2020. The Local Plan Part 2 sets out development management policies and site allocations within the administrative area. A review of the Local Plan indicates the following policy relevant to this assessment: DMEI 14: Air Quality

2.5 Air quality objectives

The Air Quality Objectives (AQOs) for nitrogen dioxide (NO_2) and particulate matter (PM_{10} and $PM_{2.5}$) are set out in Table 2. These AQOs for NO_2, PM_{10} and $PM_{2.5}$ were to have been achieved by 2005, 2004 and 2020 respectively and continue to apply in all future years thereafter.

The AQOs apply at locations where members of the public are likely to be regularly present and exposed over the averaging period of the AQO. Examples of where the annual mean AQOs should apply are provided in the London Local Air Quality Management Technical Guidance (LLAQM.19) and include building façades of residential properties, schools, hospitals. The annual mean AQOs are not relevant for the building façades of offices or other places of work where members of the public do not have regular access, kerbsides or gardens.

The 24-hour mean AQO for PM_{10} is considered to apply at the same locations as the annual mean AQO, as well as in gardens of residential properties and at hotels.

The 1-hour mean AQO for NO_2 also applies wherever members of the public might regularly spend 1-hour or more, including outdoor eating locations, pavements of busy shopping streets, carparks and bus stations which are not fully enclosed. The 1-hour mean AQO does not apply at kerbside sites where the public do not have regular access.

Table 2: Air Quality Objectives for NO_2, PM_{10} and $PM_{2.5}$

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
Fine Particles (PM_{10})	24-hour Mean	50 µg/m^3 Not to be exceeded more than 35 times a year
	Annual Mean	40 µg/m^3
Fine Particles ($PM_{2.5}$) *	Annual Mean	20 µg/m^3
Notes: Measured gravimetrically *The time period in LAQM.TG(22) states "Work towards reducing emissions/concentrations of fine particulate matter ($PM_{2.5}$)"		

2.6 World Health Organisation guideline values.

The World Health Organisation (WHO) has produced air quality guidelines[23] to offer global guidance on thresholds and limits for key air pollutants that pose health risks. The Greater London Authority (GLA) confirmed that the relevant WHO guidelines referred to in the London Plan are from 2005 and as such these

have been provided below in Table 3 for NO_2, PM_{10} and $PM_{2.5}$ concentrations. The WHO published updated air quality guidelines in 2021[24], however these have not been adopted into policy at the current time.

Table 3: WHO guidelines for NO_2, PM_{10} and $PM_{2.5}$

Pollutant	Time Period	Objective
NO_2	1-hour Mean	200 µg/m^3
	Annual Mean	40 µg/m^3
PM_{10}	Annual Mean	20 µg/m^3
$PM_{2.5}$	Annual Mean	10 µg/m^3

3. Methodology of assessment.

This section outlines the methodology undertaken for the air quality assessment.

3.1 Existing air quality in the study area.

A baseline air quality review was undertaken to determine the existing air quality in the vicinity of the Site.

This desk-top study was undertaken using the following sources:

- Air quality data for LBH, including a review of the most recent air quality reports and local monitoring data;
- The UK Pollutant Release and Transfer Register[25];
- Background pollution maps from Defra's Local Air Quality Management (LAQM) website[26];
- Pollution Inventory from the Environment Agency[27];
- The UK Ambient Air Quality Interactive Map[28]; and
- Ordnance Survey data and Aerial photography from Google Maps.

3.2 Combustion plant assessment.

Impacts associated with the Proposed Combustion Plant have been modelled using the ADMS 6 (v.6.0.2.0) dispersion modelling software. ADMS 6 is an extensively validated Gaussian plume air dispersion model, and is used by regulators, government departments, consultancies and industry.

The key air pollutants of concern during the operational phase of the Proposed Combustion Plant are nitrogen oxides (NO_X), NO_2 derived from NO_X, and PM_{10}.

NOx emissions have been converted to NO_2 by multiplying by 0.7 for annual mean concentrations and multiplying by 0.35 for 1-hour mean concentrations for comparison against the annual and 1-hour mean AQOs, in line with EA Guidance[22].

Due to the low particulate matter (PM) emission rate associated with the proposed combustion plant, it is anticipated that PM_{10} and $PM_{2.5}$ emissions will be negligible at all receptors. As such, PM impacts have been screened out of this assessment.

3.2.1 Combustion plant specifications.

The Proposed Combustion Plant specifications have been provided by the project engineers, The Richard Stephens Partnership Limited. It has been confirmed that the generators used to provide resilience to substations 2 & 3 will be the Perkins 4012-46TWG2A diesel generators with a standby power rating of 1,217 kW.

The generators will have individual, vertical flues terminating at 10.0 m above ground. This is 3 m above the highest point of the generator housing. A detailed summary of all model inputs is provided in Appendix 2.

3.2.2 Operational hours.

The purpose of the Proposed Combustion Plant is to provide back-up and life safety power for Harefield Hospital. The Proposed Combustion Plant will not form part of the normal operating energy strategy for Harefield Hospital and will only be operational for testing purposes and in the event of a power outage.

The proposed testing schedule for the generators will comprise monthly tests at up to 100% load for up to three hours per month for a total of 36 hours for both generators per year. Both generators will initially start up for synchronisation purposes for a short duration (estimated to be less than five minutes). Only one generator will operate for the full three-hour testing period. The generator operating for the full three-hour testing period will alternate each month. Due to the short duration of the synchronisation test, it has not been considered in this model. As such, for this assessment, each generator has been modelled independently for a full year for 36 hours each and worst-case impacts from each generator at each sensitive receptor have been presented.

For annual mean NO_2 concentrations, the model has been run for a full year and factored by the total number of hours the Proposed Combustion Plant will be operational (36 hours) divided by the total number of hours in

the dataset (8,760 hours per year). This allows the model to capture all meteorological conditions for a full year and average the annual mean concentrations across the full range.

For 1-hour mean NO_2 concentrations; in order to capture all of the various meteorological conditions throughout the year the model has been run for a full operational year for each year modelled and the 67.27th percentile has been derived using hypergeometric distribution. This percentile represents a 1% risk that there will be more than 18 exceedances of 200 µg/m^3 per year based on a 36-hour testing period.

In order to capture worst-case meteorological conditions, three meteorological years have been modelled in ADMS 6: 2022, 2023 and 2024. The worst-case impacts at each receptor location from the three modelled years has been presented in this report.

3.2.3 Receptors.

Impacts of the Proposed Combustion Plant have been predicted at four existing sensitive receptor locations in the vicinity of the Site. In order to effectively consider the conservative air quality impacts of the Proposed Development, existing receptors have been identified based on worst-case nearby human exposure close to the Site. Modelled receptor locating are presented in Table 4 and Figure 2.

Table 4: Modelled existing sensitive receptors.

Receptor ID	Description	Receptor Type	Grid Reference		Modelled Heights (m)	LT/ST
			Easting (X)	Northing (Y)		
R1	Harefield Village Green - Playground	Park	505282	190706	1.5	ST
R2	1a Rickmansworth Road	Residential	505287	190741	1.5,4.5	LT/ST
R3	10 Rickmansworth Road	Residential	505298	190760	1.5,4.5	LT/ST
R4	14 Rickmansworth Road	Residential	505306	190779	1.5,4.5	LT/ST
R5	New Park Road 2	Residential	505308	190802	1.5,4.5	LT/ST
R6	New Park Road 1	Residential	505317	190830	1.5	LT/ST
R7	The Harefield Practice	Healthcare	505242	190711	1.5	LT/ST
R8	The Harefield Practice	Healthcare	505226	190726	1.5	LT/ST
R9	Harefield Health Centre	Healthcare	505224	190744	1.5	LT/ST
R10	Harefield Health Centre	Healthcare	505204	190733	1.5,4.5	LT/ST
R11	Harefield Health Centre	Healthcare	505256	190779	1.5	LT/ST
R12	Harefield Health Centre	Healthcare	505227	190773	1.5	LT/ST
R13	Harefield Health Centre	Healthcare	505242	190796	1.5	LT/ST
LT – Long term receptors where the annual mean and short term means apply ST – Short term receptors where only the 1-hour mean applies						

Figure 2: Existing sensitive receptor locations. Contains OS Data © Crown Copyright and Database rights 2025.

It should be noted that the existing sensitive receptors listed in Table 4 and displayed in Figure 2 is not an exhaustive list, and there may be other locations within the vicinity of the Site which may experience air quality impacts as a result of emissions generated by the Proposed Combustion Plant that have not been individually assessed.

3.3 Assessment of significance.

3.3.1 Operational impacts

The EPUK and IAQM guidance has been used to assess the potential for significant impacts as a result of emissions from the Proposed Combustion Plant on existing sensitive receptors in the vicinity of the Site. The air quality impacts at existing sensitive receptors have been determined by identifying the percentage change in concentrations relative to the AQOs and comparing this with the total long-term average concentration (existing baseline concentration + Proposed Combustion Plant contribution).

Table 5: EPUK and IAQM impact descriptors for individual receptors

Long term average concentration at receptor in assessment year	% Change in concentration relative to Air Quality Assessment Level (AQAL)			
	1	2-5	6-10	>10
75% or less of AQAL	Negligible	Negligible	Slight	Moderate
76-94% of AQAL	Negligible	Slight	Moderate	Moderate
95-102% of AQAL	Slight	Moderate	Moderate	Substantial
103-109% of AQAL	Moderate	Moderate	Substantial	Substantial
110% of more of AQAL	Moderate	Substantial	Substantial	Substantial

The short-term objectives have also been assessed against the criteria in the EPUK and IAQM document. These impact descriptors are based solely on the predicted process contribution from the Proposed Combustion Plant as follows:

- <10% of the AQAL – negligible
- 11-20% of the AQAL – slight impact
- 21-50% of the AQAL – moderate impact
- >51% of the AQAL – substantial impact

For existing sensitive receptors considered in this assessment, the process contribution is the change in predicted concentration against the predicted Defra background concentration. The background concentrations used in this assessment are presented in Table 10 in Appendix 2 of this report.

Where significant impacts are predicted, mitigation measures are recommended to reduce the impact. The determination of the significance of impacts includes elements of professional judgement and the professional experience of the consultants preparing the report is set out in Appendix 3.

The overall significance of the air quality impacts is judged as either significant or not significant taking account of:

- The existing and future air quality in the absence of the development;
- The extent of current and future population exposure to the impacts; and
- The influence and validity of any assumptions adopted when undertaking the prediction of impacts.

The Proposed Combustion Plant will not introduce any new sensitive receptors at the Proposed Combustion Plant location and therefore an assessment of site suitability, which refers to the exposure of future users at the Proposed Combustion Plant location to existing air quality, has been screened out of this assessment.

4. Baseline environment.

This section sets out the available information on air quality in the vicinity of the Site.

4.1 Local air quality management review and assessment.

According to the most recent LBH Air Quality Annual Status Report (ASR) (2024)[29], the primary source of air pollution in the borough is road traffic. There is one Air Quality Management Area (AQMA) declared by LBH in 2003 due to exceedances of the annual mean NO_2 AQO. This AQMA is located approximately 3 km south of the Site.

It should be noted that the pollutant concentrations recorded in 2020 and 2021 from the most recent LBH ASR are lower than previous years as a direct result of reduced traffic levels during the COVID-19 pandemic. As such the pollutant concentrations recorded in 2020 and 2021 are not considered to be representative of 'normal' air quality conditions. However, these have been included for reference.

The latest year of available representative monitoring data, 2023, has been used as the baseline year within this assessment.

4.2 Local air quality monitoring.

LBH operated 14 automatic monitoring stations in 2023, with the closest site being HI1, located approximately 8 km south east of the Site. The automatic monitoring locations operated by LBH are located in more urban areas than the locale of the Site, therefore they are not considered to be representative of baseline air quality at the Site.

LBH operated 55 passive diffusion tube to monitor annual mean NO_2 concentrations in 2023. A review of the most recent monitoring data available indicated that there is one passive diffusion tube monitoring location within the vicinity of the Site. Recent monitoring results are shown in Table 6 and the passive diffusion tube monitoring location is illustrated in Figure 3.

Table 6: Passive Diffusion Tube Monitoring Results

Site ID	Site Type	Site Name	Distance (m) from site (approx.)	Annual Mean NO_2 Concentration (µg/m^3)				
				2019	2020	2021	2022	2023
HILL14	Urban Background	Harefield Hospital Hill End Road (lamp-post outside entrance)	170	22	16	15	17	14
Annual mean concentrations rounded to the nearest whole number.								

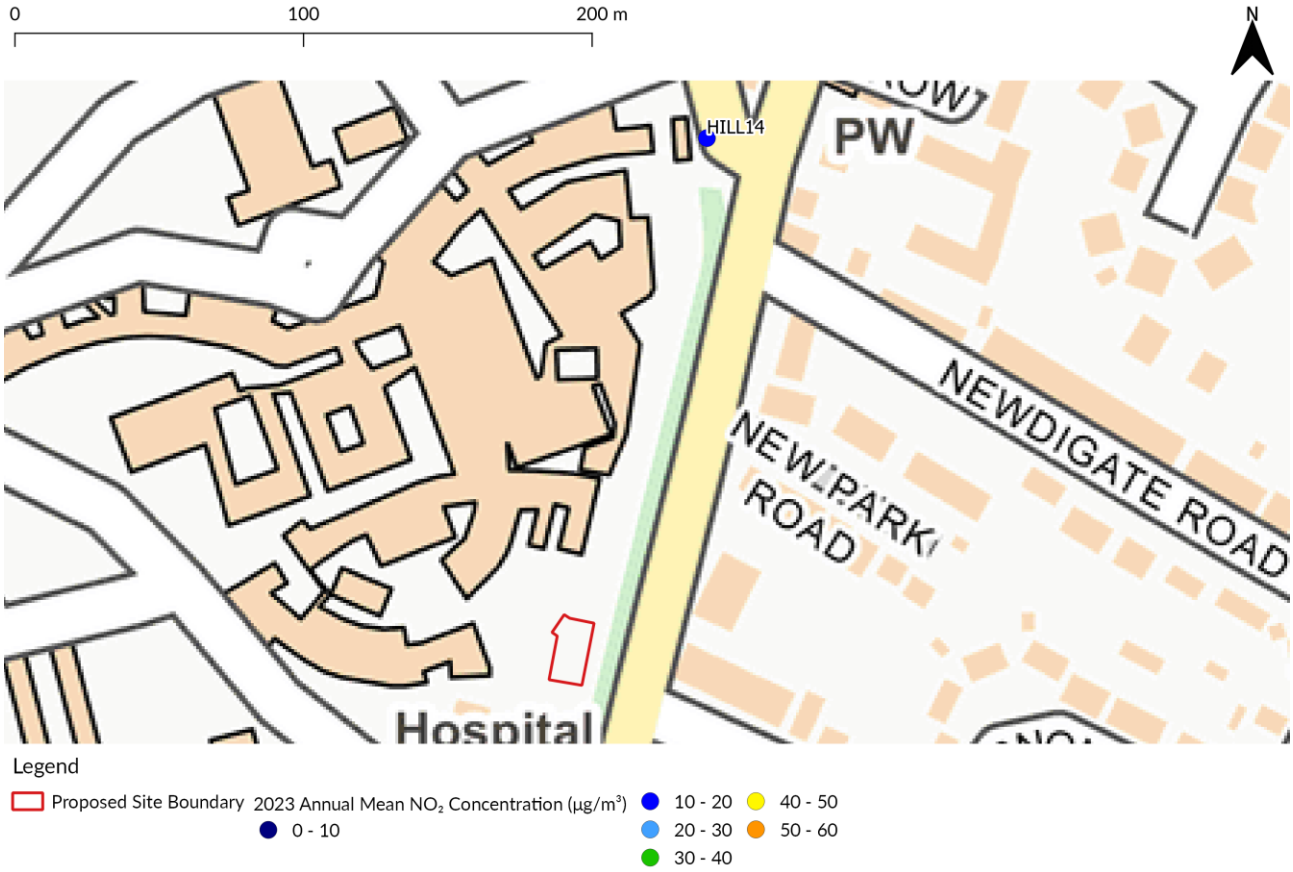

Figure 3: Passive diffusion tube monitoring location. Contains OS Data © Crown Copyright and Database rights 2025.

As shown in Table 6 above, there have been no exceedances of the annual mean NO_2 AQO or WHO guidelines recorded at the passive diffusion tube monitoring location in the vicinity of the Site.

Furthermore, as outlined in LLAQM.TG(19), an annual mean concentration of 60 µg/m^3 or above is often used to indicate a possible exceedance of the 1-hour mean NO_2 AQO. This level has not been exceeded between 2019-2023 at the passive diffusion tube monitoring location in the vicinity of the Site. Therefore, no exceedances of the 1-hour mean NO_2 AQO or WHO guideline are expected at the Site.

There is no PM_{10} or $PM_{2.5}$ monitoring in the vicinity of the Site.

4.3 Industrial pollution.

A desk-based review of potential industrial sources using the UK Pollutant Release and Transfer Register and the Pollution Inventory from the Environment Agency did not identify any significant industrial or waste management sources of air pollution within 2 km of the Application Site that are likely to affect the Application Site with regard to air quality.

4.4 Defra predicted concentrations.

The background concentrations have been obtained from the national maps published by Defra. These estimated concentrations are produced on a 1 km by 1 km grid basis for the whole of the UK. The Application Site falls into grid square X 505500 Y 190500. The predicted concentrations for this grid square for NO_2, PM_{10} and $PM_{2.5}$ are provided in Table 7 for 2023, the most recent year with available monitoring data and for 2025, the current year.

Table 7: Predicted Background Concentrations for grid squares containing the Site.

Year	Predicted Background Concentration (µg/m^3)		
	NO_2	PM_{10}	$PM_{2.5}$
2023	11.8	15.2	10.4
2025	11.2	14.7	9.8

As shown in Table 7, background concentrations are below the relevant AQOs in both years for all pollutants and below the WHO guidelines for all pollutants in 2025. The $PM_{2.5}$ WHO guideline was exceeded in the Defra background concentration in 2023.

4.5 Summary of background data.

The Site is not located within an AQMA. LBH have declared one AQMA, located approximately 3 km south of the Site.

There is no automatic monitoring located in the vicinity of the Site. There is one passive diffusion tube monitoring location operated by LBH in the vicinity of the Site. This monitoring location recorded no exceedances of the annual mean NO_2 AQO and WHO guideline, or the 1-hour mean NO_2 AQO indicative level between 2019-2023.

There are no industrial or waste management sources of air pollution that are likely to affect the Site.

Defra predicted background concentrations for NO_2, PM_{10} and $PM_{2.5}$ are below the relevant AQOs in both years for all pollutants and below the WHO guidelines for all pollutants in 2025. The $PM_{2.5}$ WHO guideline was exceeded in the Defra background concentration in 2023.

5. Combustion plant assessment results.

The potential for air quality impacts from the operation of the Proposed Combustion Plant is assessed in this section.

In order to capture all of the various meteorological conditions throughout the year, the model has been run for a full operational year for each of the three years modelled and the 67.27th percentile has been derived using hypergeometric distribution. This percentile represents a 1% risk that there will be more than 18 exceedances of 200 µg/m^3 per year based on a 36-hour testing period.

Worst-case concentrations from the three modelled meteorological years (2022, 2023 and 2024) have been presented.

Due to the low PM emission rate associated with the Proposed Combustion Plant, impacts at existing sensitive receptors associated with PM_{10} and $PM_{2.5}$ are anticipated to be negligible. As such, PM impacts have been screened out of this assessment.

5.1 NO_2 concentrations.

5.1.1 Existing sensitive receptor impacts.

NO_2 concentrations have been predicted at four existing sensitive receptor locations in the vicinity of the Site.

5.1.1.1 Annual mean impacts.

The annual mean NO_2 AQO is applicable at R2-R13. The maximum change in concentration occurred at R4, with a change of 0.5 µg/m^3, or 1.2 % of the AQO. The maximum concentration also occurred at R4, with a concentration of 11.6 µg/m^3, or 29.1% of the AQO.

As such, the predicted annual mean NO_2 impact at R4, and all other existing sensitive receptors, can be considered negligible and therefore not significant.

Full model results have been presented in Appendix 3 for reference.

5.1.1.2 1-Hour mean impacts.

The maximum 1-hour NO_2 concentrations modelled at each existing sensitive receptor. The maximum change in concentration occurred at R5, with a concentration of 13.1 µg/m^3, or 6.6% of the AQO. The maximum total concentration also occurred at R5, with a concentration of 35.5 µg/m^3.

As such, the predicted 1-hour mean NO_2 impacts at R5, and all other existing sensitive receptors, can be considered negligible and therefore not significant.

Full model results have been presented in Appendix 3 for reference.

5.2 Assessment of significance.

In summary, the Proposed Combustion Plant is predicted to have negligible impacts on the annual mean NO_2 AQO and 1-hour mean NO_2 AQO at all modelled existing sensitive receptors in the vicinity of the Proposed Combustion Plant.

Furthermore, the Proposed Combustion Plant is predicted to have negligible impacts on the 1-hour mean NO_2 AQO at all modelled existing sensitive receptors. The total predicted 1-hour mean NO_2 concentration is less than 200 µg/m^3 at all modelled existing sensitive receptors.

Therefore, in line with the EPUK and IAQM guidance, the impact of the Proposed Combustion Plant is therefore considered to be not significant at existing sensitive receptors and no further mitigation for combustion emissions is required. Following best practice inspection and maintenance of the combustion plant, air quality impacts associated with the operation of the Development will remain not significant throughout the life of the combustion plant.

6. Summary and conclusions.

This report details the potential air quality impacts associated with the construction and operation of a Proposed Combustion Plant at Harefield Hospital, Hill End Road, Harefield, UB9 6JH.

The findings of the assessment are as follows:

- The baseline assessment has shown that the Proposed Development is not located within an AQMA. The closest passive diffusion tube monitoring location to the Site did not record any exceedances of the annual mean NO_2 AQO and WHO guideline, or the indicative 1-hour mean NO_2 AQO and WHO guideline level in the last five years of monitoring data;
- The Proposed Combustion Plant energy strategy is comprised of two diesel generators with a standby power rating of 1,217 kW each. A detailed dispersion modelling assessment of air quality emissions during the testing of the Proposed Combustion Plant has been undertaken. The impacts on the annual mean NO_2 AQO and 1-hour mean NO_2 AQO at existing sensitive receptors are predicted to be negligible and therefore not significant. As such, no additional mitigation is required for the Proposed Combustion Plant with regards to air quality.

Based on the information above, it is considered that air quality should not be viewed as a constraint to planning. The Proposed Development conforms to the principles of National Planning Policy Framework, the London Plan and the Hillingdon Local Plan.

7. Glossary of terms.

AQFA	Air Quality Focus Area
AQMA	Air Quality Management Area
AQO	Air Quality Objective
BAT	Best Available Techniques
Defra	Department for Environment, Food and Rural Affairs
ELV	Emissions Limit Values
EPA	Environmental Protection Agency
EPUK	Environmental Protection UK
GLA	Greater London Authority
IAQM	Institute of Air Quality Management
LAQM	Local Air Quality Management
LES	London Environment Strategy
LLAQM.TG	London Local Air Quality Management Technical Guidance
µg/m^3	Micrograms per cubic metre
MAQS	Mayor's Air Quality Strategy
NO_2	Nitrogen dioxide
NO_x	Nitrogen oxides (taken to be NO_2 + NO)
NPPF	National Planning Policy Framework
Objectives	A nationally defined set of health-based concentrations for nine pollutants, seven of which are incorporated in Regulations, setting out the extent to which the standards should be achieved by a defined date. There are also vegetation-based objectives for sulphur dioxide and nitrogen oxides
PM	Particulate matter
PM_{10}	Particulate matter with an aerodynamic diameter less than 10 micrometres
$PM_{2.5}$	Particulate matter with an aerodynamic diameter less than 2.5 micrometres
PPG	Planning Practice Guidance
Standards	A nationally defined set of concentrations for nine pollutants below which health effects do not occur or are minimal
WHO	World Health Organisation

References.

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Appendix 1 – Legislation, policy and guidance.

Table 8: Legislation and National Policy Summary Table

Legislation and national policy	Summary notes
The Environment Act 1995 (Part IV)	The Environment Act requires the Secretary of State to publish an air quality strategy and local authorities to review and assess the quality of air within their boundaries (the latter is known as Local Air Quality Management)
The Air Quality Strategy	The Air Quality Strategy provides the policy framework for local air quality management and assessment in the UK. It sets out air quality standards and objectives for key air pollutants. These standards and objectives are designed to protect human health and the environment. The Strategy also sets out how the different sectors of industry, transport, and local government, can contribute to achieving these AQOs
The Environment Act 2021	The Environment Act 2021 acts as the UK's new framework of environmental protection and came into force on 1st April 2022. Regarding air quality, the Environment Act establishes a legally binding duty on government to bring forward at least two new air quality targets in secondary legislation. This was implemented through the Environmental Improvement Plan which outlines new $PM_{2.5}$ targets for future years. These are a long-term target of 10 $\mu g/m^3$ by 2040 and an interim target of 12 $\mu g/m^3$ by 31st January 2028. These targets are expected to focus on reducing concentrations of, and exposure to, $PM_{2.5}$.
EU Limit Values.	The European Union has also set limit values for NO_2, PM_{10} and $PM_{2.5}$; these are legally binding and have been implemented into English legislation by The Air Quality Standards Regulations 2010 and The Air Quality Standards (Amendment) Regulations 2016. The limit values for NO_2, PM_{10} and $PM_{2.5}$ are the same as the English objectives (given in Table 2), but applied from 2010 for NO_2, 2005 for PM_{10} and 2015 for $PM_{2.5}$. The limit values apply at all locations (apart from where the public does not have access, where health and safety at work provisions apply and on the road carriageway).
Statutory Nuisance Legislation	Part III of the Environmental Protection Act (EPA) 1990 (as amended) and Section 79 of the EPA. Fractions of dust greater than 10 µm (i.e., greater than PM_{10}) in diameter typically relate to nuisance effects as opposed to potential health effects and therefore are not covered within the UK Air Quality Strategy. In legislation there are currently no numerical limits in terms of what level of dust deposition constitutes a nuisance.
Clean Air Strategy	The Clean Air Strategy (CAS), published in 2019 sets out the Government's proposals aimed at delivering cleaner air in England, and indicates how devolved administrations intend to make emissions reductions. It sets out the comprehensive action that is required from across all parts of government and society to deliver clean air.
Building Regulations	Part F of the Building Regulations (2021) provides guidance for indoor air quality and the pollutant concentrations that must not be exceeded in both buildings for dwellings and non-dwellings.
National Planning Policy Framework	The National Planning Policy Framework (NPPF) 2023 sets out planning policy for England. It includes advice on when air quality should be a material consideration in development control decisions. The most relevant Paragraphs for air quality are included below: Paragraph 180: *"Planning policies and decisions should contribute to and enhance the natural and local environment by: […]* *e) preventing new and existing development from contributing to, 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*

Legislation and national policy	Summary notes
	conditions such as air and water quality, taking into account relevant information such as river basin management plans. […] " 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 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."* Paragraph 192: "*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."*
Planning Practice Guidance	The NPPF is supported by Planning Practice Guidance (PPG) which sets out relevant information for this assessment in: Paragraph 001 (Reference ID: 32-001-20191101) Paragraph 002 (Reference ID: 32-002-20191101) Paragraph 005 (Reference ID: 32-005-20191101) The PPG also sets out the information that may be required in an air quality assessment in: Paragraph 007 (Reference ID: 32-007-20191101) It also provides guidance on options for mitigating air quality impacts in: Paragraph 008 (Reference ID: 32-008-20191101):
The London Plan 2021	This Plan is the Spatial Development Strategy for Greater London. It sets out a framework for how London will develop over the next 20-25 years (covering the period 2019-2041) and the Mayor's vision for Good Growth. The Plan is part of the statutory development plan for London, meaning that the policies in the Plan should inform decisions on planning applications across the capital. The London Plan 2021 is the third London Plan, the previous ones being the 2004 London Plan and the 2011 London Plan. All of the other iterations of the London Plan from 2004-2016 have been alterations. This London Plan replaces all previous versions. Policy SI 1 'Improving air quality' is relevant to this assessment and has been considered throughout. Additional sections of the London Plan have also been considered as part of this assessment: Section 9.1.2: *"The Mayor is committed to making air quality in London the best of any major world city, which means not only achieving compliance with legal limits for Nitrogen Dioxide as soon as possible and maintaining compliance where it is already achieved, but also achieving World Health Organisation targets for other pollutants such as Particulate Matter.*" Section 9.1.3: *"The aim of this policy is to ensure that new developments are designed and built, as far as is possible, to improve local air quality and reduce the extent to which the public are exposed to poor air quality. This means that new developments, as a minimum, must not cause new exceedances of legal air quality standards, or delay the date at which compliance will be achieved in areas that are currently in exceedance of legal limits. Where limit values are already met or are predicted to be met at the time of completion, new developments must endeavour to maintain the best ambient air quality compatible with sustainable development principles."*

Legislation and national policy	Summary notes
	Section 9.1.4: "*Where this policy refers to 'existing poor air quality' this should be taken to include areas where legal limits for any pollutant, or World Health Organisation targets for Particulate Matter, are already exceeded and areas where current pollution levels are within 5 per cent of these limits."* Additionally, Policy GG3 'Creating a healthy city' states: *"To improve Londoners' health and reduce health inequalities, those involved in planning and development must:* *[…]* *F seek to improve London's air quality, reduce public exposure to poor air quality and minimise inequalities in levels of exposure to air pollution."*
The London Environment Strategy (LES), 2018	The London Environment Strategy (LES), published in May 2018, supersedes the previous Mayor's Air Quality Strategy (MAQS) for London, published in December 2010. The LES aims to reduce pollution concentrations in London to achieve compliance within the EU limit values as soon as possible. The LES commits to the continuation of measures identified in the 2002 and 2010 MAQS and sets out a series of additional measures. Proposal 4.3.3.a states that the London Strategy provides policies in which all new large-scale developments can not only become 'Air Quality Positive', but also maintain Air Quality Neutral requirements for all other developments. Within the planning guidance for building operations and transport emissions, information about emission benchmarks for 'Air Quality Neutral' developments are set out. Any development that either meets or exceeds the benchmarks is considered air quality neutral as they avoid any increase in PM and NO_X emissions. In order for the benchmarks to remain relevant, the Mayor will continue to review them. To ensure that the requirements are met, execution of the air quality neutral policy will be monitored by utilising both the LLAQM and the London Plan monitoring report. The following proposed policies relate to the planning process with regards to improving air quality: Policy 4.2.2: "*Reduce emissions from non-road transport sources, including by phasing out fossil fuels,*" Policy 4.2.3: "*Reduce emissions from non-transport sources, including by phasing out fossil fuels,*" Policy 4.2.4: "*The Mayor will work with the government, the London boroughs and other partners to accelerate the achievement of legal limits in Greater London and improve air quality*;" Policy 4.2.5: "*The Mayor will work with other cities (here and internationally), global city and industry networks to share best practice, lead action and support evidence-based steps to improve air quality*;" Policy 4.3.1: "*The Mayor will establish new targets for $PM_{2.5}$ and other pollutants where needed. The Mayor will seek to meet these targets as soon as possible, working with government and other partners,*" Policy 4.3.2: "*The Mayor will encourage the take up of ultra-low and zero emission technologies to make sure London's entire transport system is zero emission by 2050 to further reduce levels of pollution and achieve WHO air quality guidelines*;" Policy 4.3.3: "*Phase out the use of fossil fuels to heat, cool and maintain London's buildings, homes and urban spaces, and reduce the impact of building emissions on air quality;"* Policy 4.3.4: "*Work to reduce exposure to indoor air pollutants in the home, schools, workplace and other enclosed spaces.*"

Legislation and national policy	Summary notes
	Furthermore, the LES outlines that negative consequences that can occur from developing air quality and climate policies in isolation, particularly with regards to energy and planning policy. Instead, integrated policy design can lead to benefits such as reducing carbon emissions by switching to zero emission vehicles simultaneously. The LES also includes the focus on the 187 Air Quality Focus Areas (AQFA) declared by the GLA. Focus Areas are defined to address concerns raised by boroughs within the LAQM review process and forecasted air pollution trends. These are locations that not only exceed the EU annual mean limit value for NO_2 but are also locations with high human exposure. This is not an exhaustive list of London's hotspot locations, but where the GLA believe the problem to be most acute.

Table 9: Primary Guidance Documents summary table

Primary guidance documents	Summary notes
Defra Local Air Quality Management Technical Guidance	Defra's LAQM.TG(22)[16] was published for use by local authorities in their LAQM review and assessment work. The document provides key guidance in aspects or air quality assessment, including screening, use of monitoring data and use of background data that are applicable to all air quality assessments.
The Mayor of London's Local Air Quality Management Technical Guidance	The LLAQM.TG(19)[17] was published for use by local authorities in their LAQM review and assessment work. The document provides key guidance in aspects or air quality assessment, including screening, use of monitoring data and use of background data that are applicable to all air quality assessments.
EPUK and IAQM 'Air Quality Guidance for Planning'	Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM) have together published guidance (EPUK and IAQM planning guidance)[18] to help ensure that air quality is properly accounted for in the development control process.
The Environment Agency's 'Medium Combustion Plant Directive' (MCPD)	Medium combustion plant installations are defined as combustion plant with a total thermal capacity of more than or equal to 1 MW and less than 50 MW burning any fuel. The MCPD[20] sets out emissions limit values for any new combustion plant. These limit values must be met before the plant is commissioned.
The Environment Agency's Emergency backup diesel engines on installations: best available techniques (BAT)	Large facility combustion plant undertaking specific types of activity are required to use BAT[21] to reduce emissions to the atmosphere. Competent authorities are to set ELVs that ensure that, under normal operating conditions, emissions do not exceed the emission levels. Under 'General Considerations' of the BAT Conclusions, the legislation references the following in relation to air quality: *"The BAT-AELs set out in these BAT conclusions may not apply to liquid-fuel-fired and gas-fired turbines and engines for emergency use operated less than 500 h/yr, when such emergency use is not compatible with meeting the BAT-AELs."*

Appendix 2 – Proposed Combustion Plant model input data and assumptions.

Proposed Combustion Plant.

The ADMS 6 (v.6.0.2.0) model has been run to predict the contribution of the Proposed Combustion Plant to annual mean NO_2 and 67.27th percentile of 1-hour mean NO_2 concentrations. The approach recommended by Defra/EA online guidance has been used to estimate annual mean NO_2 concentrations and 67.27th percentile of 1-hour mean NO_2 concentrations from the modelled NO_X output assuming:

- Annual mean NO_2 concentrations = factored (36 hours of operation divided by 8,760 hours per year) annual mean NO_X concentrations multiplied by 0.7; and
- 67.27th percentile of 1-hour mean NO_2 concentrations which considers the 1% risk that an exceedance will occur based on the 36 hour per year testing schedule and the use of a hypergeometric distribution = 67.27th percentile of 1-hour mean NO_X multiplied by 0.35.

Modelled PM_{10} emissions were predicted to be negligible at all receptors due to the low PM_{10} emissions rate for the Proposed Combustion Plant.

It should be noted that the percentile does not change between leap year 2024 and non-leap years 2022 and 2023.

Background data.

The Defra predicted background concentrations for 2025, the current year, was used in calculating the total concentrations when added to the process contribution for NO_2. The Defra predicted background concentrations used in the assessment are presented in Table 10.

Table 10: Defra Predicted Background Concentrations used in Calculations.

NGR X Y (m)	2024 Predicted Annual Mean Concentration (µg/m^3)	
	Long Term	Short Term*
505500, 190500	11.2	22.4
Note: Short Term concentration is double the long term concentrations.		

In line with LAQM.TG(22), the background concentration used in assessing the short-term process contribution is the annual mean background concentration for NO_2 doubled.

Model input parameters.

The Proposed Combustion Plant will include two Perkins 4012-46TWG2A 1217 kW diesel generators, each with a separate flue. The data input to the model are shown in Table 11.

Table 11: Model Input Parameters used in ADMS 6

Parameter	Input
Number of Units	2
Make and Model	Perkins 4012-46TWG2A 1,217 kW diesel generators
Fuel	Diesel

Parameter		Input
Gross engine power (kW) (standby)		1,217
Exhaust gas temperature (°C)		422
Normalised exhaust gas volume flow rate (Nm^3/s)		1.64*
Actual exhaust gas volume flow rate (m^3/s)		3.83
Flue height above ground level (m)		10.04
Internal Flue diameter (mm)		400
NO_X emission rate per unit	mg/m^3	5,400
	g/s	8.88
PM_{10} emission rate per unit	mg/m^3	50
	g/s	0.08
Note: Emissions for normalised conditions of 25°C only as outlined within the emissions data sheet for this generator.		

Buildings.

Entrainment of the plume into the wake of the building (the building downwash effect) has been simulated within the model. All buildings that have been include within the model are outlined in Table 12 and displayed in Figure 4.

Table 12: Modelled building input parameters.

Building ID	Component Number	Building Description	X (Centre Point of Building)	Y (Centre Point of Building)	Width (m)	Length (m)	Orientation (deg)	Height (m)
1	1	Generator 1 Housing	505248.7	190744.9	3.2	9.3	12.0	3.2
	2	Generator 1 Intake	505249.3	190748.1	3.2	2.7	12.0	7.0
2	1	Generator 2 Housing	505252.9	190744.0	3.2	9.3	12.0	3.2
	2	Generator 2 Intake	505253.6	190747.3	3.2	2.7	12.0	7.0
3	1	The Harefield Practice	505216.3	190711.0	33.2	11.1	104.0	5.4
	2		505236.4	190706.1	12.8	31.1	103.0	5.4
4	1	The Harefield Centre, Southern Building	505212.6	190745.3	21.2	11.0	158.3	3.9
	2		505178.4	190743.7	50.9	18.6	182.0	9.6
5	1	The Harefield Centre, North of Generators	505257.7	190792.9	8.8	25.7	7.9	2.8
	2		505243.9	190801.9	22.2	10.0	2.0	2.8

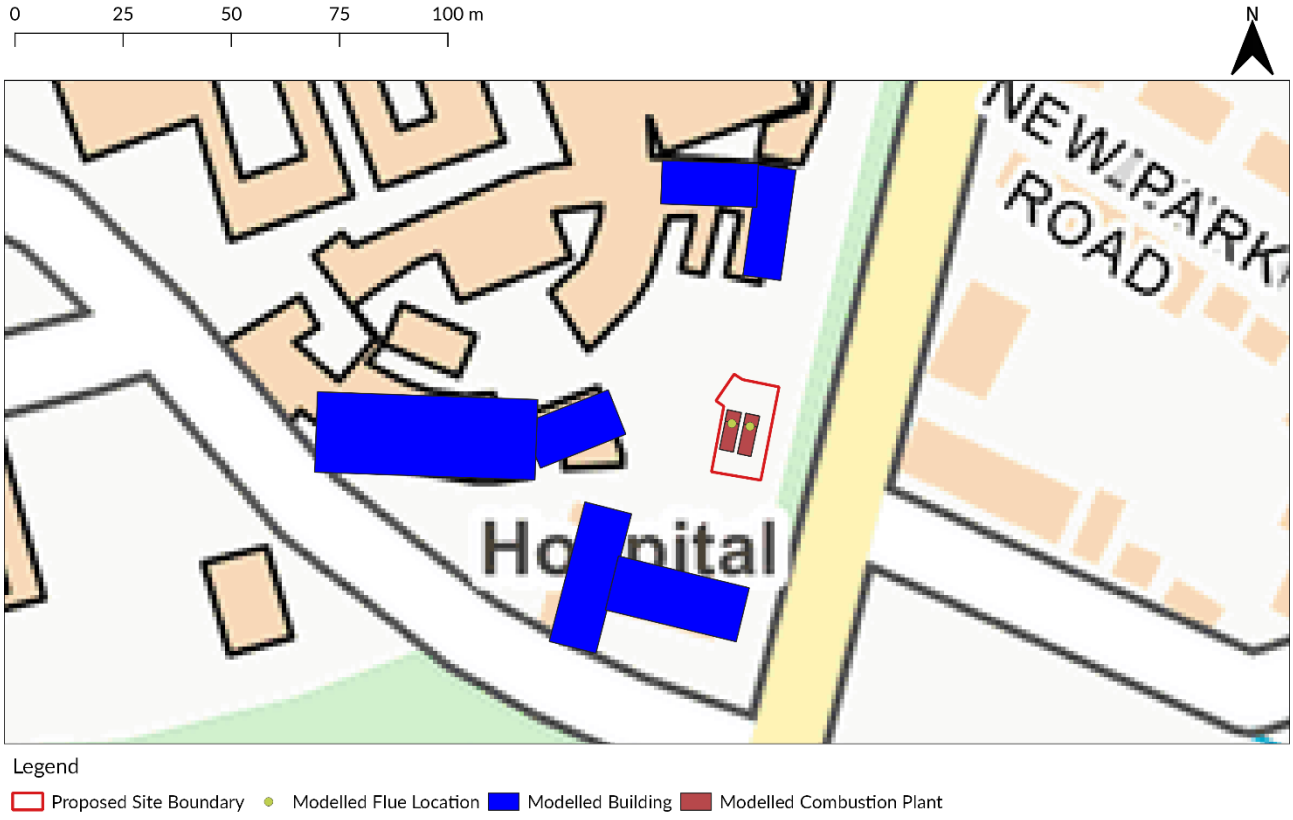

Figure 4: Modelled buildings. Contains OS Data © Crown Copyright and Database rights (2025).

Meteorological data.

The meteorological data has been taken from the monitoring station located at Heathrow Airport, which is considered suitable for the area due to its proximity to the Site and the similarity of surrounding terrain. Table 13 shows the values for surface roughness and the Monin-Obukhov length inputs used in the model.

Table 13: Meteorological Data Settings used in ADMS 6

Meteorology		Value
Monin-Obukhov Length (m)	Dispersion Site	30
	Meteorological Measurement Site	30
Surface Roughness (m)	Dispersion Site	0.5
	Meteorological Measurement Site	0.3

Worst case pollutant contributions from the three modelled years (2022, 2023 and 2024) have been presented in the results.

Appendix 3 - Full Model Results.

Table 14: Annual Mean NO2 Modelling Results.

Receptor ID	Annual Mean NO2 Background Concentration (µg/m3)	Generator Contribution (µg/m3)	Total Annual Mean NO2 (µg/m3)	Total Annual Mean as a Percentage of the AQO	Generator Contribution as a Percentage of the AQO	Impact Descriptor
R1	11.2	<0.1	11.2	28.0	0.1	N/A*
R2	11.2	0.1	11.3	28.3	0.4	Negligible
R3	11.2	0.4	11.6	29.1	1.1	Negligible
R4	11.2	0.5	11.6	29.1	1.2	Negligible
R5	11.2	0.4	11.6	28.9	1.0	Negligible
R6	11.2	0.3	11.5	28.6	0.7	Negligible
R7	11.2	<0.1	11.2	28.0	0.0	Negligible
R8	11.2	<0.1	11.2	28.0	0.1	Negligible
R9	11.2	<0.1	11.2	28.0	0.0	Negligible
R10	11.2	0.1	11.3	28.2	0.3	Negligible
R11	11.2	0.1	11.2	28.1	0.2	Negligible
R12	11.2	<0.1	11.2	28.1	0.1	Negligible
R13	11.2	0.1	11.3	28.2	0.2	Negligible
*N/A indicates annual mean AQO not applicable at existing sensitive receptor location						

Table 15: 1-hour Mean NO2 Modelling Results.

Receptor ID	1-hour Mean NO2 Background Concentration (µg/m3)	Generator Contribution (µg/m3)	Total 1-hour Mean NO2 (µg/m3)	Generator Contribution as a Percentage of the AQO	Impact Descriptor
R1	22.4	<0.1	22.4	<0.1	Negligible
R2	22.4	<0.1	22.4	<0.1	Negligible
R3	22.4	1.1	23.5	0.6	Negligible
R4	22.4	8.0	30.3	4.0	Negligible
R5	22.4	13.1	35.5	6.6	Negligible
R6	22.4	5.9	28.2	2.9	Negligible
R7	22.4	<0.1	22.4	<0.1	Negligible
R8	22.4	<0.1	22.4	<0.1	Negligible
R9	22.4	<0.1	22.4	<0.1	Negligible
R10	22.4	<0.1	22.4	<0.1	Negligible
R11	22.4	<0.1	22.4	<0.1	Negligible
R12	22.4	<0.1	22.4	<0.1	Negligible

Receptor ID	1-hour Mean NO2 Background Concentration (µg/m3)	Generator Contribution (µg/m3)	Total 1-hour Mean NO2 (µg/m3)	Generator Contribution as a Percentage of the AQO	Impact Descriptor
R13	22.4	<0.1	22.4	<0.1	Negligible

Appendix 4 - Professional experience.

Andy Day (Hoare Lea), BSc (Hons), MSc, AMIEnvSc, MIAQM
Andy is an Associate Air Quality Consultant with Hoare Lea. He is an Associate Member of the Institute of Environmental Sciences and a Full Member of the Institute of Air Quality Management. He is a chemistry graduate with a Master's specialising in the catalysed removal of harmful volatile organic compounds (VOCs) often generated from the combustion of fuel in car engines.

Andy has worked on a range of projects of varying size across a number of different sectors. His experience focusses on work up to and through planning for air quality assessments and environmental impact assessments. Andy also has experience in detailed dispersion modelling of road traffic and energy combustion plant, emission mitigation statements, damage cost calculations, indoor and outdoor air quality monitoring and assessing the air quality impact at ecologically sensitive sites.

Andy has a particular interest in reducing emissions for the benefit of human health and the environment through the life cycle of a building.

Josh Jones (Hoare Lea), MSci (Hons), MIEnvSc, MIAQM
Josh is a Principal Air Quality Consultant with Hoare Lea. He has over 8 years' experience in the Air Quality field. His role includes the production and project management of air quality assessments, including monitoring and detailed dispersion modelling of dust, odour, roads and industrial emissions, in support of both planning and permit applications for a wide variety of clients across a range of sectors, including residential, industrial, energy and healthcare. He also has detailed knowledge of the LAQM process, the EIA process, co-ordination of multi-disciplinary environmental impact assessment work in support of planning applications and dispersion modelling studies.

Oliver Parsons (Hoare Lea), BSc (Hons), MSc, MIEnvSc, MIAQM
Oliver is a Senior Air Quality Consultant with Hoare Lea. He is a Full Member of the Institution of Environmental Sciences and a Full Member of the Institute of Air Quality Management. He has worked on projects across multiple sectors including residential, commercial and industrial sectors.

He has completed eight EIA within the past three years at Hoare Lea including SSEN (film studio), The Galleries (mixed use residential) and SBQ (mixed use residential). He has experience across different aspects of the air quality assessment processes including monitoring, detailed dispersion modelling of roads, standalone air quality assessments and environmental impact assessments.

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