



West Drayton Leisure Centre

LOW EMISSION STRATEGY





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1 INTRODUCTION

- 1.1.1 The application site lies within the administrative boundary of the London Borough of Hillingdon and is situated within Drayton Garden Village to the north of Heathrow Airport. The proposed development will include a climbing wall, soft play, sports hall, 3G pitch and a 25m swimming pool. A fitness suite, studio, spinning room and youth zone are also included within the development.
- 1.1.2 WSP has been commissioned by Buckingham Group Contract Ltd to produce a Low Emissions Strategy (LES) for the proposed demolition of the former Abacus Contact Centre and development of a new sport and leisure centre with associated infrastructure and parking at Rowheys Place, West Drayton (herein referred to as the proposed development or application site).
- 1.1.3 The application site lies within the administrative boundary of the London Borough of Hillingdon (LBH) and is situated within Drayton Garden Village to the north of Heathrow Airport. The proposed development will include a climbing wall, soft play, sports hall, 3G pitch and a 25m swimming pool. A fitness suite, studio, spinning room and youth zone are also included within the development.
- 1.1.4 The LES will support the planning application by making a commitment to implement the mitigation measures that are required to reduce the exposure to future users/occupants to poor air quality and to help mitigate the development's air pollution impacts. The strategy will review the air quality neutral previously undertaken in accordance with the Mayor of London SPG 'Sustainable Design and Construction' (April 2014) guidance¹⁶ and provide a damage cost calculation. Approved details shall be fully implemented prior to development and maintained through the operational use of the leisure centre.
- 1.1.5 The LES has reviewed the Air Quality Assessment, Air Quality Neutral Assessment and suggested mitigation against the LBH Quality Action Plan 2019-2024¹³, to present mitigation proportionate to the damage cost calculated.
- 1.1.6 The location of the Proposed Development with reference to local emission constraints is shown in **Figure A-1**.

2 LEGISLATION, POLICY AND GUIDANCE

2.1 LEGISLATION

- 2.1.1 Air quality legislation in the UK is derived from Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and Cleaner Air for Europe¹ which defines the limit values for pollutants and the obligations on nation states to monitor and control emissions to air.
- 2.1.2 Following the UK exit from the European Union, all applicable aspects of European environmental legislation were transposed into UK law through the European Union (Withdrawal Agreement) Act 2020². To ensure compliance with the provisions of the provisions of Directive 2008/50/EC and the European Union (Withdrawal Agreement) Act 2020, a PM_{2.5} limit value was adopted through The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020³. Environmental Law in the UK was then further modified through the implementation of the Environment Act 2021⁴.
- 2.1.3 Directive 2008/50/EC is transposed into English law by the Air Quality Standards Regulations 2010⁵ as amended, maintaining the limit values and obligations from directive 2008/50/EC.
- 2.1.4 The Environment Act 1995 requires the UK Government and devolved administrations to produce a national air quality strategy (AQS) which sets out the UK's air quality objectives and recognises that action at a national, regional and local level may be needed proportionate to the scale and nature of air quality issues.

The limit and objective values from legislation and the AQS are shown in **Table 2-1**.

Table 2-1 – Summary of relevant legislation

Pollutant	Objective/ Limit Value	Measure as	Date to be achieved by and maintained thereafter		
			AQS	Regs	2008/50/EC
NO ₂	200 µg/m ³ Not to be exceeded more than 18 times a year	1-hour mean	31-Dec-05	31-Dec-05	1-Jan-10
	40 µg/m ³	Annual mean	31-Dec-05	31-Dec-05	1-Jan-10

¹ European Parliament and Council (2008) Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe [\[online\]](#) accessed February 2019

² UK Government (2020) European Union (Withdrawal Agreement) Act 2020. [Online] <https://www.legislation.gov.uk/ukpga/2020/1/contents/enacted>, accessed January 2022.

³ UK Government (2020) The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020. [Online] [The Environment \(Miscellaneous Amendments\) \(EU Exit\) Regulations 2020 \(legislation.gov.uk\)](#), accessed January 2022.

⁴ UK Government (2021) Environment Act 2021. [Online] <https://www.legislation.gov.uk/ukpga/2021/30/contents/enacted>, accessed January 2022

⁵ UK Government (2010) The Air Quality Standards Regulations 2010 [\[online\]](#) accessed February 2019

Pollutant	Objective/ Limit Value	Measure as	Date to be achieved by and maintained thereafter		
			AQS	Regs	2008/50/EC
NO _x	30 µg/m ³	Annual mean	31-Dec-00	31-Dec-00	19-Jul-01
PM ₁₀	40 µg/m ³	Annual mean	31-Dec-04	31-Dec-04	01-Jan-05
	50 µg/m ³ Not to be exceeded more than 35 times a year	24-hour mean	31-Dec-04	31-Dec-04	01-Jan-05
PM _{2.5}	20µg/m ³	Annual Mean	-	10-Dec-20	01-Jan-20

2.1.5 In 2019 the UK Government published its Clean Air Strategy⁶. The strategy recognises the effects on human health of poor air quality and the value of the natural environment and its susceptibility to air pollution. The strategy details current actions to reduce emissions from transport and other sources and reduce nitrogen deposition resulting from air pollutants to the natural environment.

2.1.6 Under part IV of the Environment Act 1995 and amendments in the Environment Act 2021⁷ require local authorities to document and review local air quality in an Annual Status Report with the aim of meeting the limit and objective values for relevant pollutants. Where the limit and objective values are unlikely to be met a local authority is required to declare an air Quality Management Area (AQMA). Where AQMAs are declared a local authority must complete an Air Quality Action Plan (AQAP) detailing measures to improve the air quality in that area towards compliance with the limit and objective values.

2.2 PLANNING POLICY

2.2.1 A summary of the relevant national and local planning policy is provided below.

2.2.2 NATIONAL PLANNING POLICY FRAMEWORK

2.2.3 The National Planning Policy Framework⁸ (NPPF) applicable to the previous ES was updated in 2019 and retains the presumption in favour of sustainable development.

⁶ Department for the Environment, Food & Rural Affairs (2019) Clean Air Strategy 2019 [online] accessed February 2019

⁷ UK Government (2021) Environment Act 2021 [Online] <https://www.legislation.gov.uk/ukpga/2021/30/contents/enacted>, accessed July 2021

⁸ Ministry of Housing, Communities & Local Government (2019) National Planning Policy Framework [online] accessed February 2019

- 2.2.4 Air quality is addressed through the promotion of sustainable transport, specifically through managing patterns of growth to focus significant development on location so that the need to travel is limited and offers a wide choice of transport modes.
- 2.2.5 It is also addressed through conserving and enhancing the natural environment by way of contributing towards compliance with the limit and objective values taking into account the presence of AQMAs and Clean Air Zones (CAZ). Developments should identify opportunities to improve air quality through traffic and travel management and provision or enhancement of green infrastructure. Where any new development is located in an AQMA or CAZ then it should be consistent with the local AQAP.
- 2.2.6 The provisions for air quality improvement remain the same in the 2021 update to the NPPF⁹.

2.2.7 THE LONDON PLAN

- 2.2.8 The London Plan 2021¹⁰ outlines specific policies relating to air quality:
- Policy GG3 Creating a healthy city: seek to improve London's air quality, reduce public exposure to poor air quality and minimise inequalities in levels of exposure to air pollution.
 - Policy D1 London's form and characteristics: help prevent or mitigate the impacts of noise and poor air quality, which seeks to ensure measures to reduce exposure to poor air quality are addressed at the earliest possible stage in the design process of development
 - Policy SI1 Improving air quality: the policy sets out how developments should not result in a deterioration in exposure to poor air quality or new exposure to poor air quality. Design solutions should be used to prevent or minimise increased exposure to existing air pollution with a focus on relevant Air Quality Focus Areas. An Environmental Impact Assessment for large scale developments should propose methods of achieving an Air Quality Positive approach through new development. 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. Development proposals should ensure that where emissions need to be reduced, this is done on-site. Where it can be demonstrated that on-site provision is impractical or inappropriate, off-site measures to improve local air quality may be acceptable, provided that equivalent air quality benefits can be demonstrated.

2.2.9 LOCAL PLAN

Hillingdon Local Plan: Part 1 - Strategic Policies

- 2.2.10 The Local Plan Part 1¹¹ was published in 2012 and sets out the overall level and broad locations of growth up to 2026. It comprises a spatial vision and strategy, strategic objectives, core policies and a monitoring and implementation framework with clear objectives for achieving delivery. Key policies in relation to the development include;
- Policy BE1: Built Environment – This policy sets out the expectation that development will improve areas of poor environmental quality, including West Drayton. It states that the council

⁹ Ministry of Housing, Communities & Local Government (2021) National Planning Policy Framework. [Online] <https://www.gov.uk/government/publications/national-planning-policy-framework--2>, accessed January 2022

¹⁰ Mayor of London (2018) Draft New London Plan showing suggested minor changes [online]

¹¹ Hillingdon.gov.uk. 2012. *Hillingdon Local Plan: Part 1 - Strategic Policies*. [online] Available at: https://www.hillingdon.gov.uk/media/3080/Local-Plan-Part-1---Strategic-Policies/pdf/Local_Plan_Part_1_Strategic_Policies_15_feb_2013_a_1_1.pdf?m=1598370401647

require all new development to achieve reductions in CO₂ emissions in line with the London Plan targets, using energy efficient design and effective low carbon technology.

- Policy EM1: Climate Change Adaption and Mitigation includes the requirement to promote a modal shift away from private car use and the inclusion of initiatives to reduce car dependency.
- Policy EM8: Land, Water, Air and Noise requires that development should not cause deterioration in the local air quality levels and should ensure the protection of existing and future receptors. All major development through the AQMA should demonstrate air quality neutrality.
- Policy T1 Accessible Local Destination states that all development should encourage access by sustainable modes and include good cycling and walking provision.
- Policy C12 Leisure and Recreation sets out the requirement for new development to promote the need to have inclusive and accessible design, to tackle climate change and to include facilities that promote sustainable transportation

Hillingdon Local Plan: Part 2 - Development Management Policies

2.2.11 The Local Plan Part 2¹² was published in 2020 and comprises Development Management Policies, Site Allocations and Designations and the Policies Map. Once adopted, it will deliver the detail of the strategic policies set out in the Local Plan Part 1.

- Policy DMEI 14: Air Quality states that development proposals should demonstrate appropriate reductions in emissions to sustain compliance with national air quality objectives for pollutants. Development proposals should be air quality neutral, include sufficient mitigation to ensure there is no unacceptable risk to receptors and actively contribute towards the improvement of air quality.

2.2.12 HILLINGDON AIR QUALITY ACTION PLAN

2.2.13 The Draft Air Quality Action Plan¹³ for LBH outlines the actions the council is taking to improve air quality in the borough. It describes compliance with the limit and objective values for all gases except for NO₂, and compliance with the limit and objective values for PM₁₀ and PM_{2.5} whilst at the same time noting that concentrations of PM can be damaging to health at any level.

2.2.14 The whole of the borough is designated as an AQMA, and also includes specific focus areas where concentrations and human exposure are both high.

2.2.15 Actions specific to this development include ensuring that emissions from construction are minimised, and the enforcement of Non-Road Mobile Machinery (NRMM) air quality policies, enforcing air quality neutral policies, promoting and delivering energy efficiency and installing Ultra-Low Emissions Vehicle (ULEV) infrastructure including electric vehicle charging points.

2.3 GUIDANCE

2.3.1 LAND-USE PLANNING & DEVELOPMENT CONTROL: PLANNING FOR AIR QUALITY

2.3.2 The guidance¹⁴ issued by The Institute for Air Quality Management (IAQM) and Environmental Protection UK details the criteria for a development where an air quality assessment may be

¹² Hillingdon.gov.uk. 2020. *Hillingdon Local Plan: Part 2 - Development Management Policies*. [online] Available at: <https://www.hillingdon.gov.uk/media/3084/Hillingdon-Local-Plan-Part-2-Development-Management-Policies/pdf/LPP2_Development_Management_Policies_-_ADOPTED_VERSION_JAN_2020_1.pdf?m=1598370641570>

¹³ London Borough of Hillingdon (2019) Air Quality Action Plan [online] accessed June 2022

¹⁴ IAQM & EPUK (2015) Land-Use Planning & Development Control: Planning for Air Quality Version 1.1 [online] accessed February 2019

necessary, the content of a likely air quality assessment, how it should be undertaken and how the results of any assessment should be interpreted, including the significance of the results and some general advice on mitigation.

- 2.3.3 This guidance is enhanced by the IAQM position statement, Mitigation of Development Air Quality Impacts¹⁵ issued June 2018, that suggests mitigation is led through hierarchical principle rather than by prescription. The hierarchy to be followed advises the principles of prevention or avoidance, then reduction and minimisation, and lastly offsetting where no other options are available or suitable. In this instance, offsetting should only be limited to measures that are likely to have a beneficial impact on air quality in the vicinity of the development site.

2.3.4 SUSTAINABLE DESIGN AND CONSTRUCTION SUPPLEMENTARY PLANNING GUIDANCE

- 2.3.5 The Sustainable Design and Construction Supplementary Planning Guidance¹⁶ outlines the requirements for developers to complete an air quality assessment and the requirement to design in measures to minimise emissions to air. It outlines the air quality neutral requirements, and also provides for offsetting emissions that cannot be avoided or minimised as part of the development design.

2.3.6 HILLINGDON PLANNING GUIDANCE SUPPLEMENTARY PLANNING DOCUMENT

- 2.3.7 The additional planning guidance¹⁷ issued by LBH provides guidance on the use of planning obligations in Hillingdon for those involved in the submission and determination of planning applications.
- 2.3.8 The SPD states that planning obligations may be sought for developments within or adjacent to the AQMA. The scale of the emissions, the likelihood of significant public exposure, ground level concentrations and whether the emissions caused by the development would impede the London Borough of Hillingdon's overriding objective to improve air quality in the area should be considered during the planning process.

2.3.9 AIR QUALITY DAMAGE COST GUIDANCE

- 2.3.10 The Defra Air quality damage cost guidance¹⁹ was updated in 2021 and includes the latest damage cost values for air pollutants based on national averages at 2017 prices. The guidance also details the method for applying the damage costs, which can also be undertaken using the Defra Air quality damage cost appraisal toolkit.

2.3.11 DEFRA LOW EMISSIONS STRATEGIES GOOD PRACTICE GUIDE

The Defra and lowemissionsstrategies.org Low Emissions Strategies Good Practise Guidance¹⁸ details how a LES is linked with a transport assessment and can be enhanced by the results of an environmental assessment. It provides some advice on typical measures that can be used to reduce

¹⁵ IAQM (2018) Mitigation of Development Air Quality Impacts Version 1.1 [online] accessed February 2019

¹⁶ Mayor of London (2014) Sustainable Design and Construction Supplementary Planning Guidance: London Plan 2011 Implementation Framework [online] accessed February 2019

¹⁷ Hillingdon.gov.uk. 2014. Supplementary Planning Document. [online] Available at: <https://www.hillingdon.gov.uk/media/3291/Document-B---Planning-Obligations-SPD/pdf/Document_B_-_Planning_Obligations_SPD.pdf?m=1598975715390>

¹⁸ Department for Environment, Food & Rural Affairs, Low Emissions Strategies (2010) Low Emissions Strategies using the planning system to reduce transport emissions: Good Practise Guidance [online]



emissions, and on potential funding strategies, including the use of damage cost calculators such as WebTAG or the Defra Air quality damage cost appraisal toolkit to request appropriate contributions from developers as part of a planning obligation, such as a Section 106 agreement

3 SCOPE AND METHODOLOGY

3.1 AIR QUALITY ASSESSMENT

- 3.1.1 The air quality chapter of the environmental statement was completed by Resource and Environmental Consultants Ltd (REC) in 2019. The assessment used a baseline year of 2018 based on the traffic data provided for the assessment and the latest air quality monitoring data available to use for verification. Traffic data was also provided for opening year scenarios predicted to be in 2022.
- 3.1.2 Vehicle emissions for the AQA were calculated using the Defra Emissions Factor (EFT) Toolkit v9. To account for uncertainty in the output of NO_x from the EFT for future years, 2021 emission factors were utilised for the prediction of pollution levels in all scenarios in preference to the opening year (2022).

3.2 TRANSPORT ASSESSMENT

- 3.2.1 The transport assessment provides extensive information on the local transport options available in the area and looks at the traffic generation from the Proposed Development and the potential impacts of this.

3.3 ENERGY ASSESSMENT

- 3.3.1 The energy assessment provides information on the efficiency of the fabric of the building, the potential for the use of photovoltaic cells and a statement on the inappropriateness of the use of gas boilers and heat pumps in the proposed development. Carbon emissions as a result of the different uses of the proposed development are detailed along with the potential for carbon offset.

3.4 TRAVEL PLAN

- 3.4.1 The travel plan is addressed in detail in Section 5.

3.5 DAMAGE COST CALCULATION

- 3.5.1 The calculation of *damage costs* to assist in informing the levels of mitigation required has been undertaken using the Defra Air quality damage cost guidance January 2021¹⁹ which places values on the pollutants according to the results of consultation with the Committee on the Medial Effects of Air Pollutants. Air pollutants relevant to the proposed development are shown with their damage cost values in **Table 3-1**. These costs are based on 2017 prices and will be adjusted to the opening year 2022.

¹⁹ Department of the Environment, Food & Rural Affairs (2021) Air quality damage cost guidance. [Online] <https://www.gov.uk/government/publications/assess-the-impact-of-air-quality/air-quality-appraisal-damage-cost-guidance#activity-costs>, accessed January 2022

Table 3-1 – Relevant pollutants and damage cost values

Pollutant Emitted	2022 Damage Costs Central Estimate (£/tonne) National Averages (2017 prices) Latest figures
NO _x (Road Transport Inner London)	£52,587
PM _{2.5} (Road Transport Inner London)	£410,293

- 3.5.2 The development lies within the M25 orbital motorway and the London Low Emissions Zone, therefore the damage cost categories for Inner London have been used in the calculations.
- 3.5.3 The damage cost with respect to PM₁₀ is calculated by applying a conversion factor of 0.651 to the calculated PM₁₀ emissions to convert to PM_{2.5}. Appropriate conversion factors for the relevant pollutant sectors are found in the air quality damage cost appraisal toolkit.
- 3.5.4 The damage costs are adjusted for GDP growth and rebased according to the guidance provided in the UK Government Damage Cost Guidance¹⁹.

4 BASELINE

4.1 LOCAL AIR QUALITY MANAGEMENT

- 4.1.1 The application site is located within the London Low Emissions Zone, and within the Hillingdon AQMA which is designed for annual NO₂ limit value exceedances and covers the entire borough council area. The area modelled as part of the air quality assessment included the West Drayton/Yiewsley Air Quality Focus Area.

4.2 LONDON ATMOSPHERIC EMISSIONS INVENTORY

- 4.2.1 The London Atmospheric Emissions Inventory²⁰ (LAEI) has been updated with a new base year for calculations and projections of 2019 from the previous 2016 base year. Future year projections based on the new base year are not yet available at the time of writing, therefore the 2019 base year predictions are presented.
- 4.2.2 **Figure A-2** shows that the application site is situated adjacent to transport emissions sources of NO₂, the Application Site is located on Harmondworth Road which will be used by traffic to access the site.
- 4.2.3 Shown on **Figure A-1** are LAEI Air Quality Focus Areas, which are areas of particular concern for high concentrations of various pollutants, a number of which are on key transport access routes to the application site. These areas are identified by the Greater London Authority as having high concentrations of air pollutants as well as high levels of human exposure. Also shown are the London Low Emission Zone (LEZ) and the extended boundary of the Ultra-Low Emission Zone (ULEZ), now in force. **Figure A-3** shows the application site to be located adjacent to a road which is a source of NO_x emissions and is located in an area that is considered in excess of the only limit value that is set for NO_x in respect of the health of vegetation.
- 4.2.4 **Figure A-4** shows the application site to be located in an area away from principal sources of PM₁₀ emissions, however it should be noted that concentrations of PM are not considered safe at any level.
- 4.2.5 **Figure A-5** shows the number of days PM₁₀ is in exceedance of the 24-hour limit of 50 µg/m³. **Figure A-5** shows that whilst days do occur where PM₁₀ concentrations are above the 24-hour limit value, this does not exceed the 35 permitted occasions at the Application Site.
- 4.2.6 **Figure A-6** shows that the application site is located away from principal sources of PM_{2.5} and that there are no areas in the vicinity of the site that are in exceedance of the new limit value for PM_{2.5} of 20 µg/m³.

4.3 HILLINGDON AIR QUALITY ACTION PLAN (2019 – 2024)

- 4.3.1 A number of measures within the Hillingdon air quality action plan are relevant to the proposed development. This are summarised in **Table 4-1**.

²⁰ Mayor of London (2021) London Datastore: Air Quality Data. [Online] <https://data.london.gov.uk/air-quality/>, accessed January 2022

Table 4-1 – LBH draft air quality action plan relevant actions

Action Description	Responsible department	Expected emissions benefit	Date to be achieved by
Ensuring emissions from construction are minimised	Planning Specialist team, Development Management	GLA Rating: 2	Throughout Plan
of Non-Road Mobile Machinery (NRMM) air quality policies (addresses emissions from e.g. building sites regarding cranes, generators, etc.)	Planning Specialist team, Development Management	GLA Rating: 1	2019/2020
Enforce Air Quality Neutral (AQN) policy with more stringent application of mitigation required in the Hillingdon Focus Areas	Planning Specialist team, Development Management	GLA Rating: 2	Throughout Plan
Ensuring adequate, appropriate, and well-located green space and infrastructure is included in new developments	Planning Specialist team, Development Management	GLA Rating: 2	Throughout Plan
Installation of Ultra-low Emissions Vehicle (ULEV) infrastructure (electric vehicle charging points, rapid electric charging points and hydrogen refuelling stations)	Transportation team, Development Management	GLA Rating: 2	2021/2022

4.3.2 **Table 4-1** shows that many of the actions relevant to the proposed development are general in nature and achieved through the relevant council departments consulting with the local population and local businesses or developers. Many of the higher impact measures are dealt with through guidance and regulations applying to Greater London as a whole and issued by the Mayor's Office, e.g. the requirement for an air quality assessment, and Air Quality Neutral policies as part of the Sustainable Design and Construction SPG.

5 TRAVEL PLAN

5.1 BASELINE SUMMARY

CAR TRIPS

- 5.1.1 As part of the proposed development, it is a requirement to submit a Travel Plan. These are to be approved by the council and should be reviewed every year up to five years from completion of the development.
- 5.1.2 The Transport Statement notes that the development is likely to generate approximately 77 vehicle trips in the morning peak period and 159 trips in the evening peak. The development will include car parking spaces for up to 199 vehicles.

Table 5-1 – Development traffic generation

Time	Traffic Generation (Total)
Morning Peak (0800-0900)	77
Evening Peak (1700-1800)	159

PEDESTRIANS

- 5.1.3 Pedestrian access to the site follows roadside public footways. There are formal pedestrian crossing points with dropped kerbs, tactile paving and street lighting at the junction of Hamondsworth Avenue, Sipson Road and Thornton Avenue.

BICYCLE ACCESS

- 5.1.4 The Site can be accessed by bicycle through the shared footway cycleway on both sides of the carriageway on Harmondsworth Road, running from West Drayton Station to the residential area of West Drayton. Several off-road cycle routes can be found in the vicinity of the site. Cycle parking includes 48 cycle parking spaces for members and 24 for visitors provided at the Site.

LOCAL BUS ROUTES

- 5.1.5 The application site is not served directly by a bus route however, the following services are within walking distance on Station Road:
- Service 222 between Uxbridge and Hounslow;
 - Service 350 between Hayes and Heathrow Terminal 5
 - Service 698 between West Drayton and Ickenham

LONDON OVERGROUND AND NETWORK RAIL

- 5.1.6 National Rail services are accessed at West Drayton Station approximately 1.3km from the application site, with services operated by Great Western Railway. The following services are operated:
- Reading;
 - London Paddington
 - Heathrow

- Essex via Liverpool Street and Canary Wharf

PARKING AND PRIVATE VEHICLES

- 5.1.7 The Proposed Development includes provision for a decked car park to the south of Rowhleys Place comprising 199 parking spaces.

CONSTRUCTION PHASE

- 5.1.8 A Construction Traffic Management Plan is required to be produced prior to development to ensure management plans are in place to minimise impact to the residents on Rowhleys Place.
- 5.1.9 During construction all staff, operatives and visitors will be encouraged to use public transport to travel to and from the application site, with modes of transport prioritised as follows:
- 1 - Walking
 - 2 - Cycling
 - 3 - Public transport, including rail, London Underground, buses and river buses
 - 4 - Car (vehicle)
- 5.1.10 It is anticipated that a proportion of the workforce will use public transport to travel to and from the application site, and local travel information will be provided as part of the Travel Plan Statement issued by itransport.

5.2 PACKAGE OF MEASURES

HARD MEASURES

- 5.2.1 No hard measures have been included within the Travel Plan.

SOFT MEASURES

- 5.2.2 The Proposed Development encourages walking to the leisure centre to reduce emissions through vehicular travel. These measures include;
- Provision of information about local walking routes between the site and key destinations through a social media travel plan page for local residents.
 - Development of walking route maps showing routes between the site and local transport hubs, services and amenities. They will include information such as calories burned, walking times and carbon savings.
 - Promotion of the health benefits of walking, including an annual 'walk to work' campaign.
- 5.2.3 Cycling will be supported and encouraged by the following measures;
- Regular monitoring of cycle parking use. If required, more parking will be installed where practicable
 - Provide up to date cycle maps from TfL covering the local area and provide links to mapping on web portals, social media or door to door leaflets
 - Promote awareness of the London Cycling Campaign
 - Promote the health, fitness and time saving benefits of cycling such as National Bike Week
- 5.2.4 Measures to increase and encourage the use of public transport as an alternative to car transport are;
- Reviewing and updating public transport information on social media pages and door to door leaflet drops; and

- Maintaining regular contact with TfL to ensure that site management and local residents are kept up to date on service improvements, including forthcoming changes in the wider area.

MANAGEMENT STRATEGY

5.2.5 An action plan to set out management of the measures to minimise emissions has been detailed within the Travel Plan. It is the responsibility of the applicant to ensure that all measures are delivered by the timescales detailed within the plan, including:

- Nominate a travel plan co-ordinator;
- Provision of secure and covered cycle parking on site;
- Information pack about the travel plan and local and national transport events and options available;
- Information on public transport routes and timetables to be made available within the Travel Plan information pack and information board;
- Promotion of cycle training courses for residents with dates and contact details to book sessions
- Set up bicycle user groups for residents;
- Information to be made available about upcoming national and local events such as 'Bike Week' and 'Walk to Work' week; and
- Monitor modal split and review the Travel Plan measures in line with the Travel Plan and modal split.

6 BOILER EMISSIONS

6.1 GAS FIRED BOILERS

- 6.1.1 The development is expected to be primarily reliant on air source heat pumps for space heating. It is anticipated that gas boilers will be installed to serve domestic hot water requirements due to their higher efficiency at heating water compared to air source heat pumps
- 6.1.2 Two scenarios for the boiler have been laid out in the Preliminary Energy Assessment and are laid out in **Table 6-1**.

Table 6-1 – Boiler scenarios and specification

Domestic Hot water	'Be Lean' scenario	'Be Green' scenario
Fuel	Main Gas	Main Gas
Generator Efficiency	86.55	86.55
Storage Volume	1000l	1000l
Storage Losses	0.0075 kWh/l/day	0.0075 kWh/l/day
Secondary Circulation	Length: 100m Loop Loss:5W/m Pump: 0.6kW	Length: 100m Loop Loss:5W/m Pump: 0.6kW
Waste Water Heat Recovery	11 units installed Heat recovery Efficiency:40%	11 units installed Heat recovery Efficiency:40%
Low Carbon Technologies	None	Photovoltaic Panels (50kWp power)

- 6.1.3 The exact boilers to be installed have not been finalised at this stage, therefore calculations for emissions and damage costs are not possible.

7 AIR QUALITY NEUTRAL

7.1 OVERVIEW

- 7.1.1 An Air Quality Neutral Assessment was undertaken for the Proposed Development as part of the Air Quality Assessment produced by REC in 2019. The results of the Air Quality Neutral Assessment are shown in **Table 7-1**.

Table 7-1 –Air Quality Neutral Results

Category	Parameter	NO _x (kg/annum)	PM ₁₀ (kg/annum)
Transport Emissions	Development Specific TEB	1,940.71	334.36
	Development Total Transport Emission	2,720.43	467.02
	Difference	779.73	132.66
	Air quality neutral?	No	No

- 7.1.2 The results in **Table 7-1** show that the result of the updated Air Quality Neutral assessment does not meet the criteria to be considered Air Quality Neutral. It is recommended that further mitigation measures are taken to reduce excess emissions generated by the development.
- 7.1.3 Mitigation measures recommended in the Air Quality Assessment carried out by REC include
- Provision of Electric Vehicle (EV) charging points;
 - The provision of a detailed residential travel plan
 - On site Cycle parking infrastructure;
 - Green infrastructure/landscaping, such as additional planting or green walls utilising species that would aid absorption of pollutants
 - All gas-fired boilers to be ultra-low NO_x (<40mgNO_x/kWh); and
 - All gas-fired CHP plant to meet minimum emission standard of:
 - Spark ignition engine (250mgNO_x /Nm³)
 - Compression ignition engine (400mgNO_x/Nm³)
 - Biomass boiler (275mgNO_x/Nm³ & 25mgPM/Nm³).

8 POLLUTANT COST CALCULATION AND REQUIREMENT FOR ADDITIONAL MITIGATION

8.1 POLLUTANT COST CALCULATION

- 8.1.1 The estimated monetary value of the pollution from emissions from the operational phase of the development has been determined using the Defra damage cost methodology. This has been undertaken for the 2022 opening year only as traffic data was only available for this year. Mass emissions from the traffic impacts have been adjusted using the latest issue of the Defra Emission Factor Toolkit in order to account for deficiencies in previous versions and account for the latest fleet distribution. A Price Base Year of 2022 has been selected for the calculations.
- 8.1.2 Emissions of PM₁₀ have been adjusted to emissions of PM_{2.5} consistent with the methodology of the Defra damage cost calculator. The calculated values are shown in **Table 8-1**.

Table 8-1 – Calculated damage cost values

	Change in Emissions (tonnes)	Adjusted Central Damage Cost (£/tonne)	Central Present Value (£)
Transport operation (NOx)	0.38	60,622	23,248
Transport operation (PM ₁₀)	0.05	472,982	13,479
Transport operation (PM _{2.5})	0.03	472,982	14,576

- 8.1.3 The Central Present Value of emissions from the development equates to **£51,303** for the 2022 opening year.
- 8.1.4 The value of the soft measures to be undertaken, and the value of the management strategy to ensure delivery of the travel plans is currently unknown

9 SUMMARY

- 9.1.1 This LES has been updated using information available from the AQA and other documents accompanying the planning application. A large number of measures are included in the travel plans associated with the application site and mitigation measures have also been proposed as a result of the Air Quality Neutral Assessment.
- 9.1.2 The updated Central Present Value of the emissions resulting from the proposed development is **£51,303** for the 2022 opening year and has been calculated based on the latest damage cost estimates from Defra and HM Treasury and the latest vehicle emission factors from Defra. This is in addition to measures undertaken as part of the LBH Draft Air Quality Action Plan. The value of the measures related to emissions reductions from the Travel Plan have not yet been quantified and therefore were unable to be included.
- 9.1.3 All on-site water and space heating energy requirements will be met by modular boilers and air source heat pumps. The proposed boiler design will be compliant with the planning conditions through measurements taken during commissioning.

Appendix A

FIGURES



Figure A-1 – Application Site and Air Quality Focus Areas

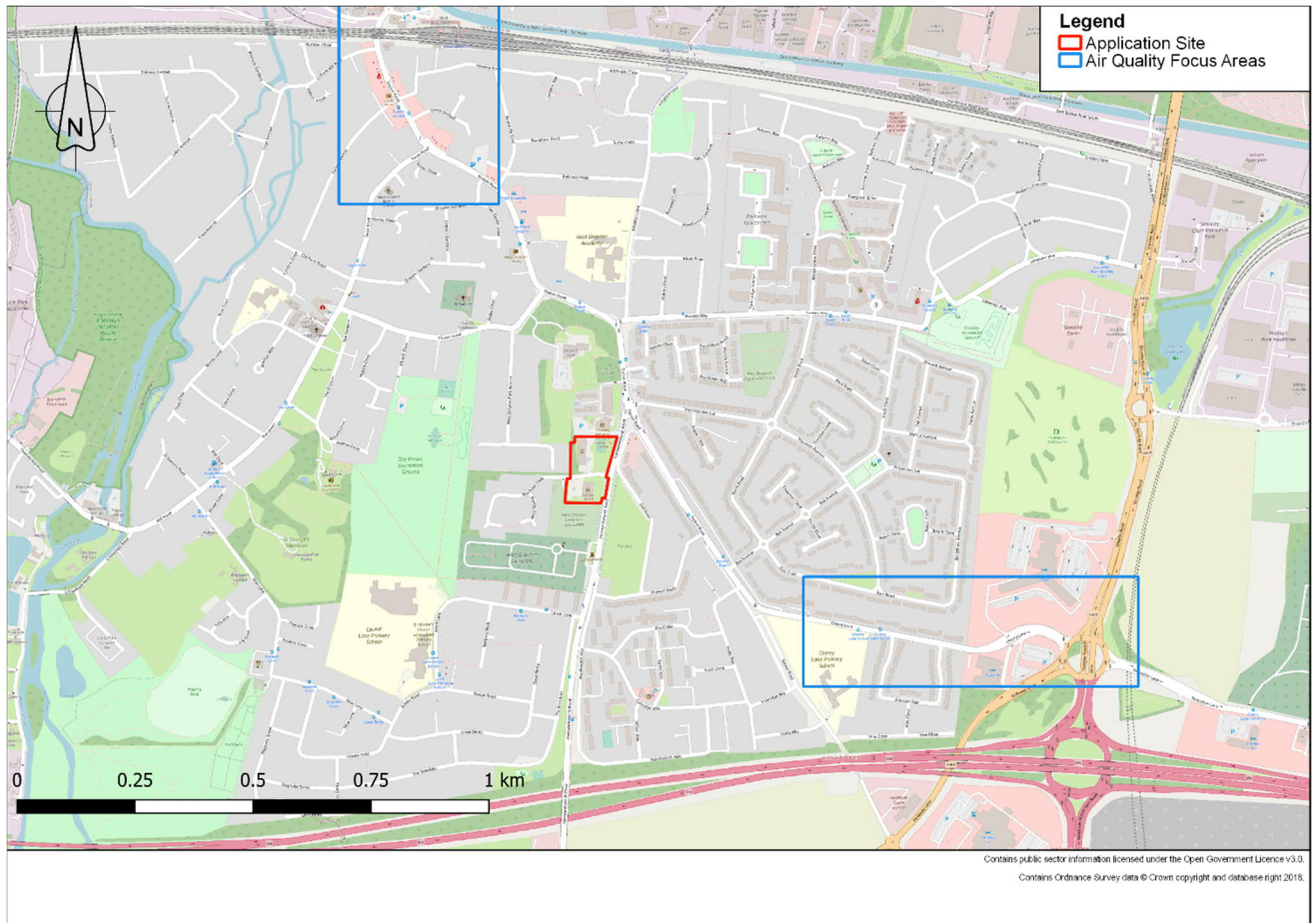


Figure A-2 - LAEI 2019 NO₂ Concentrations

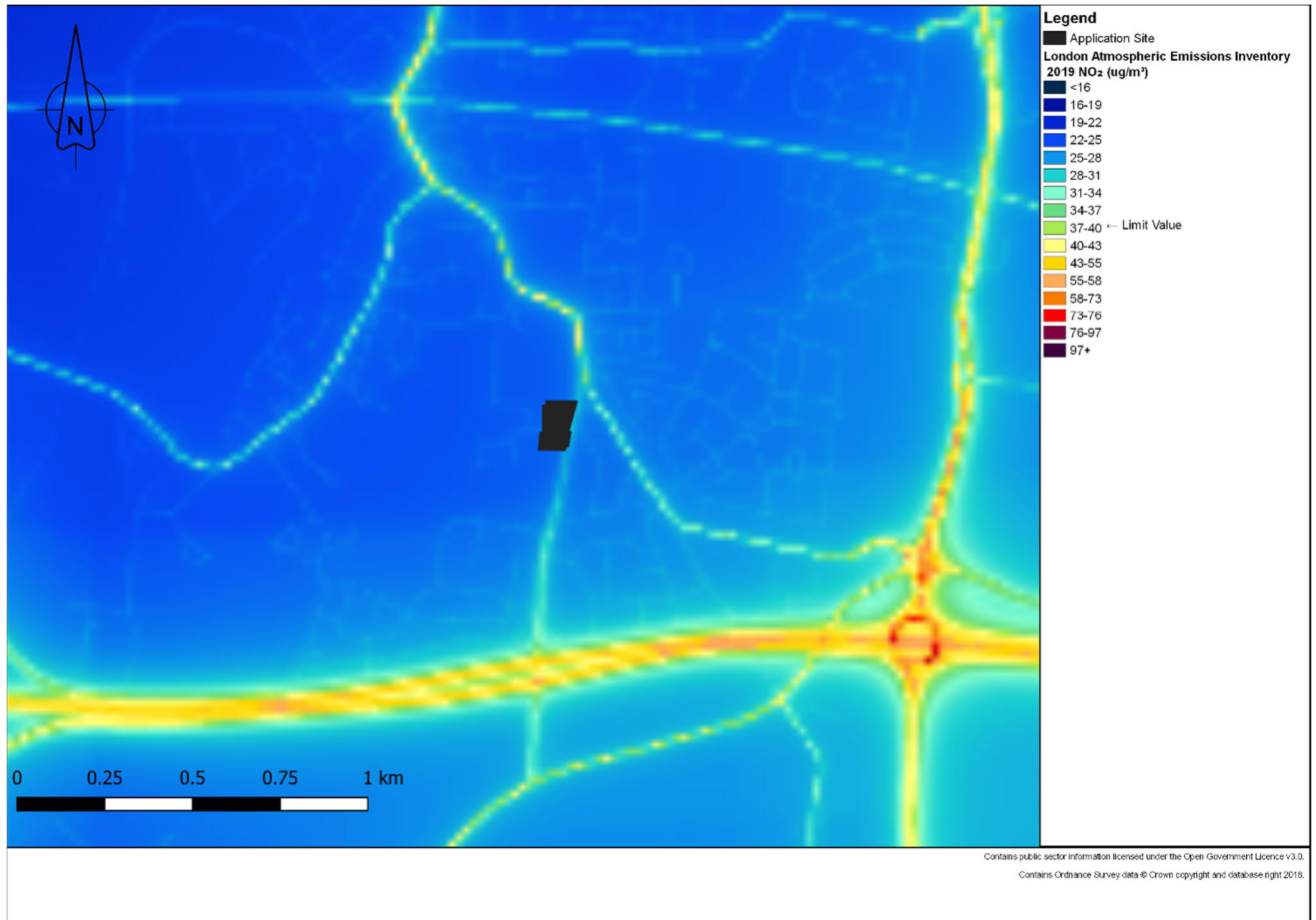


Figure A-3 - LAEI 2019 NOx Concentrations

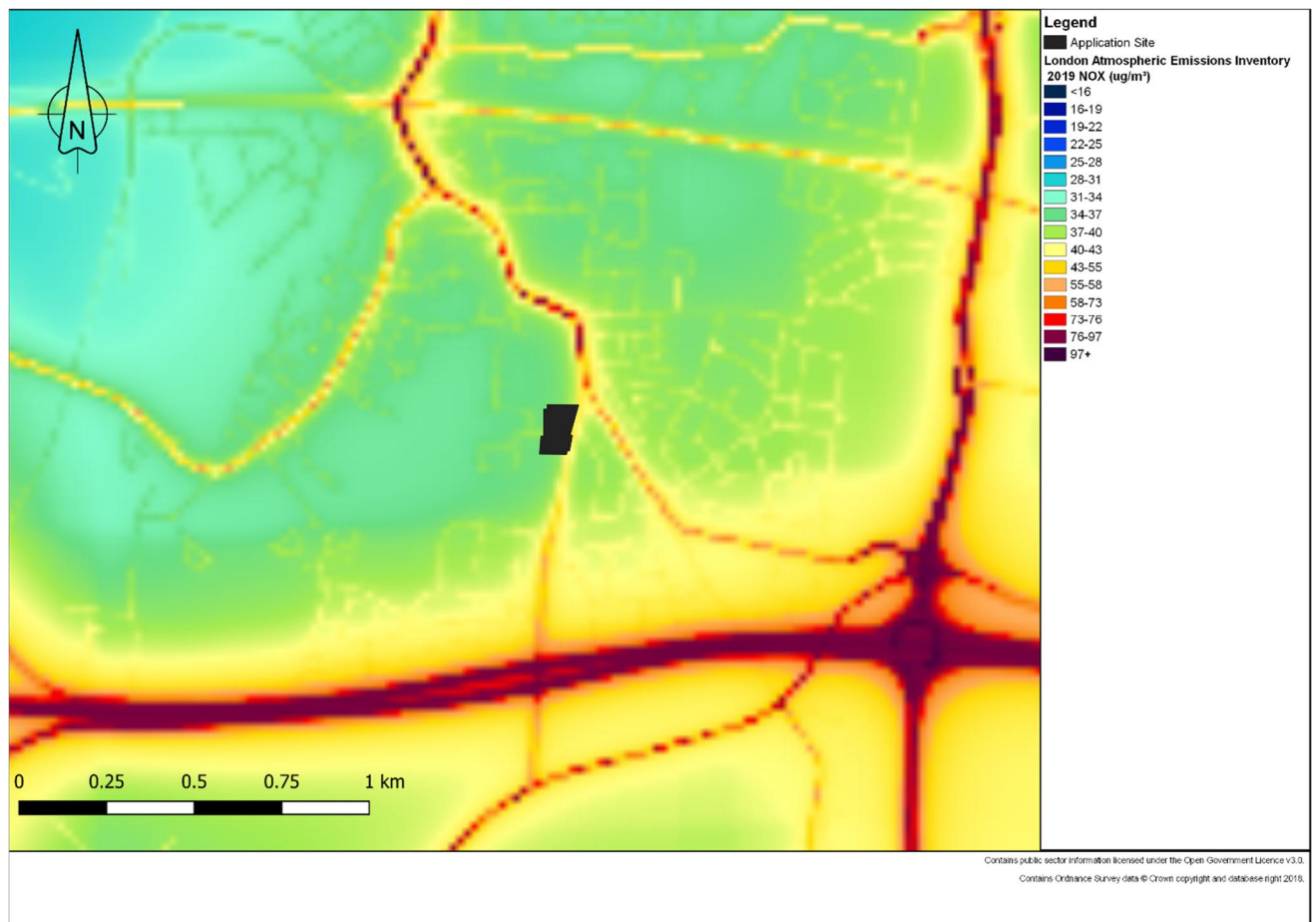


Figure A-4 - LAEI 2019 PM₁₀ Concentrations

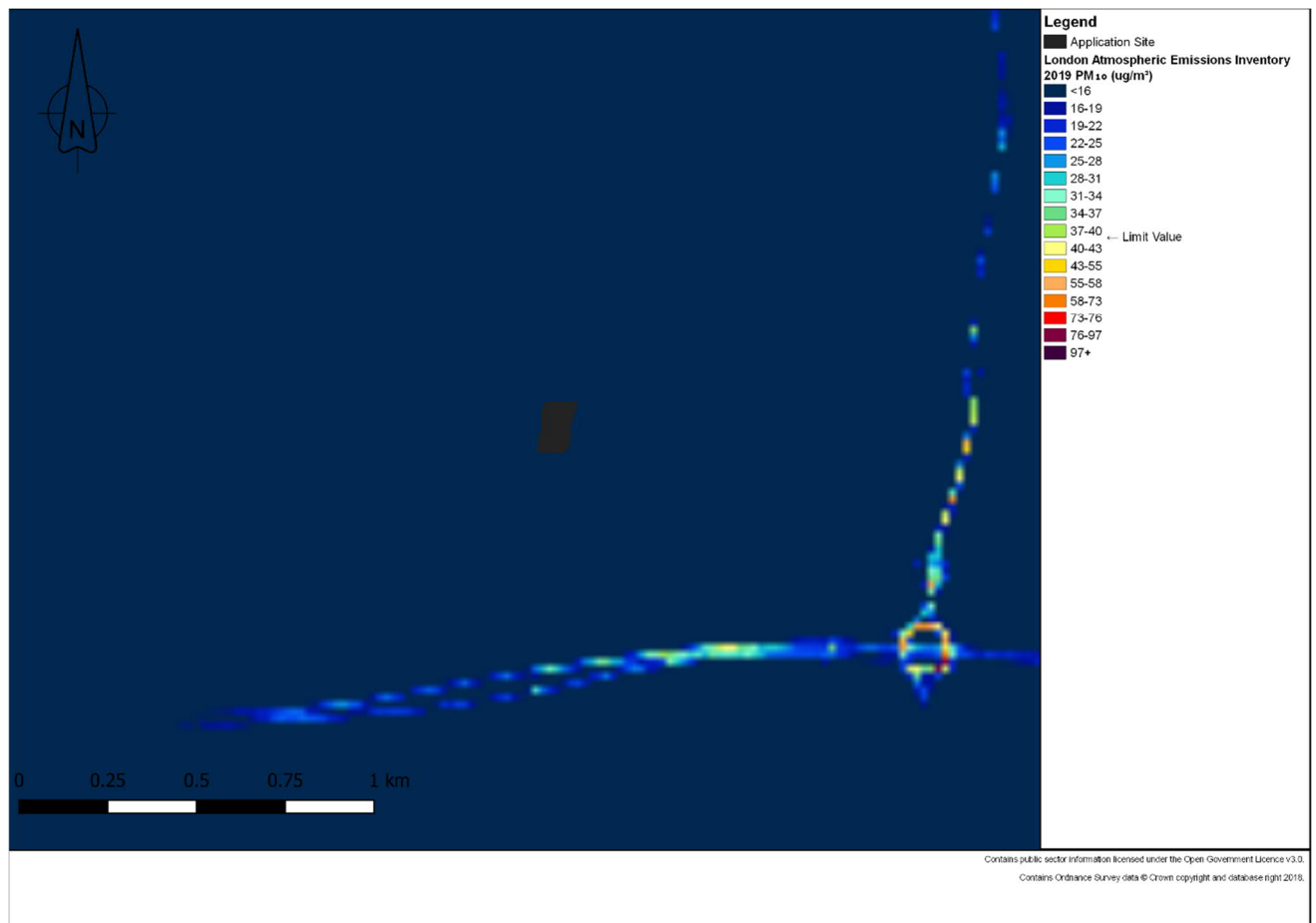


Figure A-5 - LAEI 2019 PM10 Concentrations (Daily)

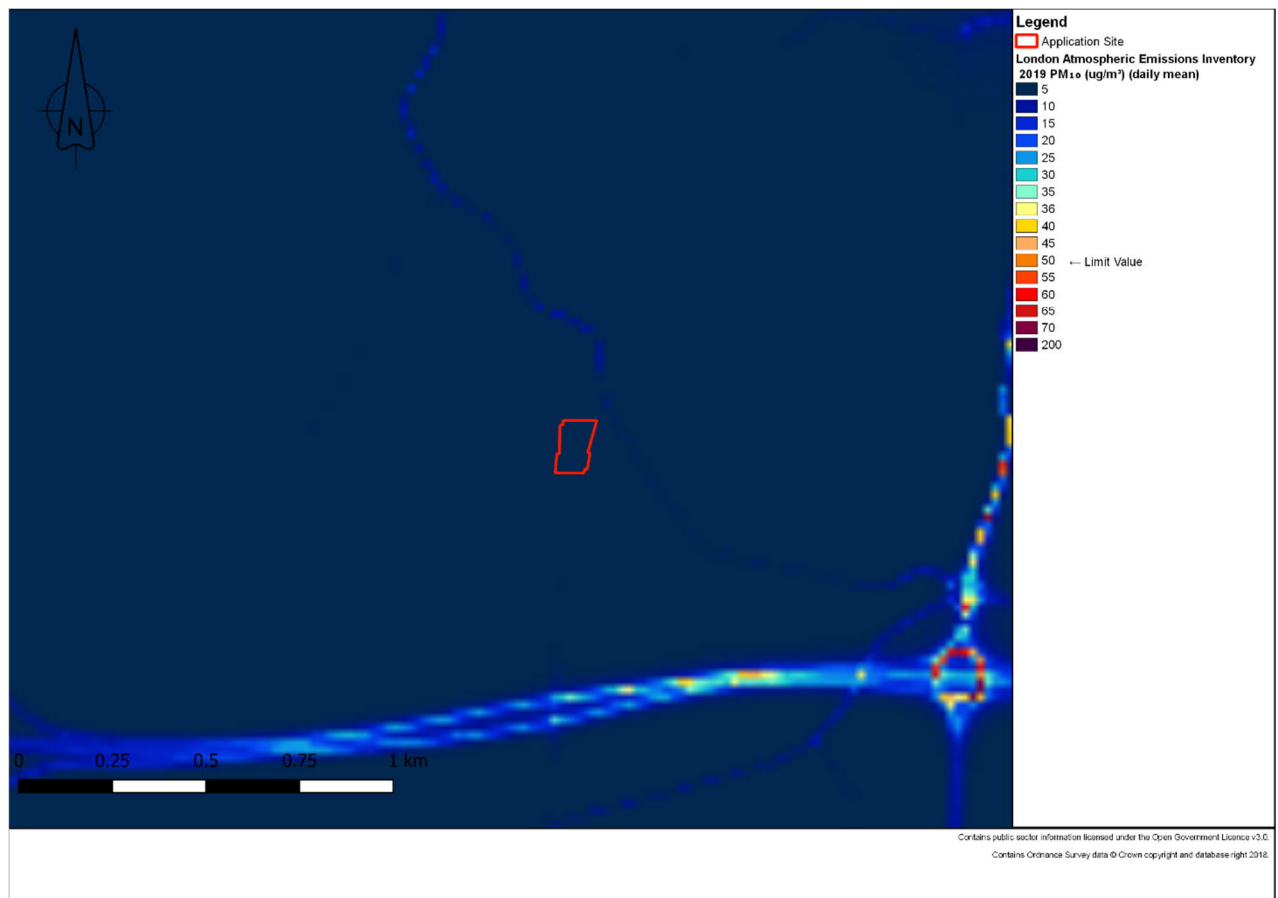
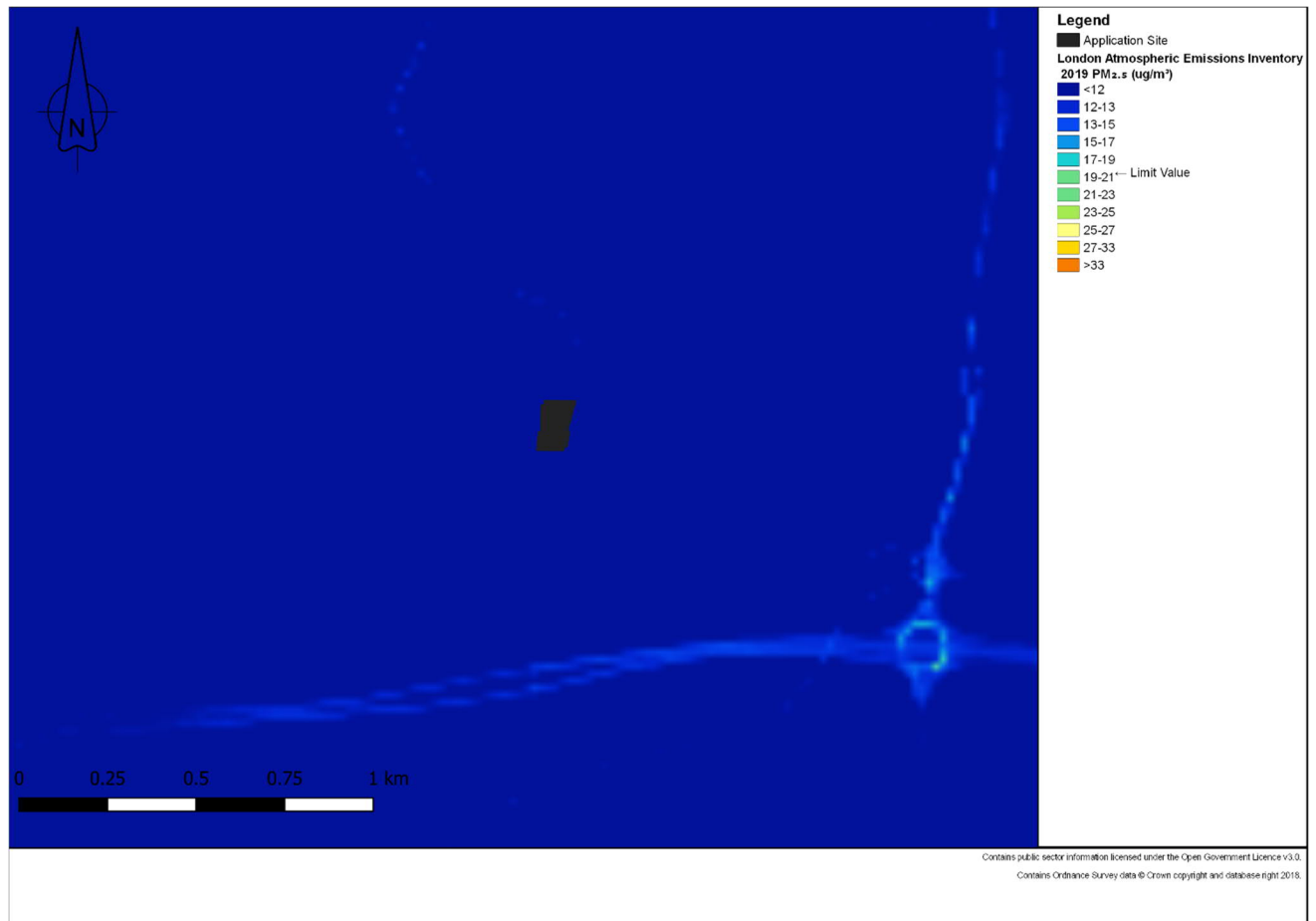


Figure A-6 - LAEI 2019 PM_{2.5} Concentrations



Appendix B

DAMAGE COST CALCULATIONS



The damage cost calculations according to the Defra air quality damage cost guidance are shown below:

NO_x		
Sector	NO_x Road Transport Central London	
Base Year	2019	
Change in Emissions (t)		0.383491
Damage Costs (£)		52587
Damage Costs Rebased (£)		54907.1
Uplift Factor		1.1
Damage Costs Uplifted (£)		60621.9
Annual Cost/Benefit (£)		23247.9
Discount Year		0
Discounted Cost/Benefit (£)		23247.92
Total Present Value (£)		23247.92

PM_{2.5}		
Sector	PM_{2.5} Road Transport Inner London	
Base Year	2019	
Change in Emissions (t)		0.028498
Damage Costs (£)		410293.0
Damage Costs Rebased (£)		428394.7
Uplift Factor		1.1
Damage Costs Uplifted (£)		472982.3
Annual Cost/Benefit (£)		13479.0
Discount Year		0.0
Discounted Cost/Benefit (£)		13479.0

PM_{2.5}		
Total Present Value (£)		13479.0

PM₁₀		
Sector	PM_{2.5} Road Transport Inner London	
Base Year	2019	
Change in Emissions (t)		0.048995
Factored emissions (t)		0.031895
Damage Costs (£)		410293.0
Damage Costs Rebased (£)		428394.7
Uplift Factor		1.1
Damage Costs Uplifted (£)		472982.3
Annual Cost/Benefit (£)		15086.0
Discount Year		1.0
Discounted Cost/Benefit (£)		14576.1
Total Present Value (£)		14576.1

Note: for the calculation of the PM₁₀ damage cost, the change in PM₁₀ emissions must be converted to PM_{2.5} emissions using factors provided in the guidance, and the damage costs for PM_{2.5} used to calculate the present value.



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