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AIR QUALITY ASSESSMENT

BEAST MARKET, HUDDERSFIELD

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REPORT PREPARED FOR: HORIZON ACCOMMODATION LIMITED

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DELIVERING ENVIRONMENTAL
AND RISK MANAGEMENT SOLUTIONS

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DELIVERING ENVIRONMENTAL
AND RISK MANAGEMENT SOLUTIONS

EXECUTIVE SUMMARY

Resource and Environmental Consultants Ltd was commissioned by Horizon Accommodation Limited to undertake an Air Quality Assessment in support of a proposed student accommodation at Beast Market, Huddersfield.

The proposals comprise the development of 12 student flats from existing hotel accommodation, alongside associated infrastructure.

The proposals is located adjacent to the A62 and within an area identified by Kirklees Metropolitan Council as experiencing elevated pollutant concentrations. Subsequently, there is potential for the proposed development to expose future residents to an existing area of poor air quality as a result of road vehicle exhaust emissions. As such, an Air Quality Assessment was therefore required to determine baseline conditions at the site and assess site suitability for the proposed end-use.

Dispersion modelling was undertaken in order to quantify pollutant concentrations across the site at a height equivalent to ground floor level to assess potential exposure of future users as a result of road vehicle exhaust emissions. Results were subsequently verified using local monitoring results provided by Kirklees Metropolitan Council.

The dispersion modelling indicated that predicted pollutant concentrations across the site were below the relevant air quality standards and, as such, the location is considered suitable for residential use without the inclusion of mitigation methods.

Potential impacts during the operational phase of the development may occur due to road traffic exhaust emissions associated with vehicles travelling to and from the site. A screening assessment was therefore undertaken to determine the potential for trips generated by the development to affect local air quality. This indicated that impacts were anticipated to be **not significant**.

Based on the assessment results, air quality exposure across the site should not be considered a constraint to planning consent for the proposed development.

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APPENDIX

1. INTRODUCTION

Resource and Environmental Consultants (REC) Ltd was commissioned by Horizon Accommodation Limited to undertake an Air Quality Assessment in support of a proposed student accommodation at Beast Market, Huddersfield.

1.1 Site Location and Context

The site is located at Beast Market, Huddersfield at the approximate National Grid Reference NGR: 414680, 416840, reference should be made to Figure 1 within Appendix I for a location plan.

The proposals comprise the redevelopment of the existing hotel accommodation to provide 12 student flats, alongside associated infrastructure.

The development site is located within the Kirklees Council (KC) Air Quality Management Area (AQMA), which has been declared for exceedances of the annual mean Air Quality Objective (AQO) for nitrogen dioxide (NO_2). As such, there is the potential for the proposals to expose future site users to elevated pollution levels. An Air Quality Assessment was therefore required to quantify pollutant levels across the site, consider its suitability for the proposed end use and assess potential impacts as a result of the development. This is detailed in the following report.

1.2 Limitations

This report has been produced in accordance with REC's standard terms of engagement. REC has prepared this report solely for the use of the Client and those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed. Should any third party wish to use or rely upon the contents of the report, written approval must be sought from REC; a charge may be levied against such approval.

2. LEGISLATION AND POLICY

2.1 European Legislation

European Union (EU) air quality legislation is provided within Directive 2008/50/EC, which came into force on 11th June 2008. This Directive consolidated previous legislation which was designed to deal with specific pollutants in a consistent manner and provided new air quality objectives for particulate matter with an aerodynamic diameter of less than 2.5µm ($PM_{2.5}$). The consolidated Directives include:

- Directive 99/30/EC - the First Air Quality "Daughter" Directive - sets ambient Air Quality Limit Values (AQLVs) for NO_2, oxides of nitrogen (NO_x), sulphur dioxide, lead and particulate matter with an aerodynamic diameter of less than 10µm (PM_{10});
- Directive 2000/69/EC - the Second Air Quality "Daughter" Directive - sets ambient AQLVs for benzene and carbon monoxide; and
- Directive 2002/3/EC - the Third Air Quality "Daughter" Directive - seeks to establish long-term objectives, target values, an alert threshold and an information threshold for concentrations of ozone in ambient air.

The fourth daughter Directive was not included within the consolidation and is described as:

- Directive 2004/107/EC - sets health-based limits on polycyclic aromatic hydrocarbons, cadmium, arsenic, nickel and mercury, for which there is a requirement to reduce exposure to as low as reasonably achievable.

2.2 UK Legislation

The Air Quality Standards (Amendment) Regulations (2016) came into force on 31st December 2016. These Regulations amend the Air Quality Standards Regulations 2010 and transpose the EU Directive 2008/50/EC into UK law. AQLVs were published in these regulations for 7 pollutants, as well as Target Values for an additional 6 pollutants.

Part IV of the Environment Act (1995) requires UK government to produce a national Air Quality Strategy (AQS) which contains standards, objectives and measures for improving ambient air quality. The most recent AQS was produced by the Department for Environment, Food and Rural Affairs (DEFRA) and published in July 2007[1]. The AQS sets out AQOs that are maximum ambient pollutant concentrations that are not to be exceeded either without exception or with a permitted number of exceedances over a specified timescale. These are generally in line with the AQLVs, although the requirements for compliance vary slightly.

Table 1 presents the AQOs for pollutants considered within this assessment.

Table 1 Air Quality Objectives

Pollutant	Air Quality Objective	
	Concentration (µg/m³)	Averaging Period
NO_2	40	Annual mean
	200	1-hour mean; not to be exceeded more than 18 times a year
PM_{10}	40	Annual mean

[1] The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, DEFRA, 2007.

Pollutant	Air Quality Objective	
	Concentration (µg/m^3)	Averaging Period
	50	24-hour mean; not to be exceeded more than 35 times a year
$PM_{2.5}$	25	Annual mean

Table 2 summarises the advice provided in DEFRA guidance LAQM (TG16)[2] on where the AQOs for pollutants considered within this report apply.

Table 2 Examples of Where the Air Quality Objectives Apply

Averaging Period	Objectives Should Apply At	Objectives Should Not Apply At
Annual mean	All locations where members of the public might be regularly exposed Building façades of residential properties, schools, hospitals, care homes etc.	Building façades of offices or other places of work where members of the public do not have regular access Hotels, unless people live there as their permanent residence Gardens of residential properties Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term
24-hour mean	All locations where the annual mean objective would apply, together with hotels. Gardens of residential properties	Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term
1-hour mean	All locations where the annual mean and 24-hour mean objectives apply. Kerbside sites (for example, pavements of busy shopping streets) Those parts of car parks, bus stations and railway stations etc. which are not fully enclosed, where members of the public might reasonably be expected to spend one hour or more Any outdoor locations where members of the public might reasonably be expected to spend one hour or longer	Kerbside sites where the public would not be expected to have regular access

2.3 Local Air Quality Management

Under Section 82 of the Environment Act (1995) (Part IV), Local Authorities (LAs) are required to periodically review and assess air quality within their area of administration under the system of Local Air Quality Management (LAQM). This review and assessment of air quality involves considering present and likely future air quality against the AQOs. If it is predicted that levels at sensitive locations where members of the public are regularly present for the relevant averaging period are likely to be exceeded, the LA is required to declare an AQMA. For each AQMA the LA is required to produce an Air

[2] Local Air Quality Management Technical Guidance 2016 LAQM (TG16), DEFRA, 2016.

Quality Action Plan (AQAP), the objective of which is to reduce pollutant concentrations in pursuit of the AQOs.

2.4 National Planning Policy

2.4.1 National Planning Policy Framework

The National Planning Policy Framework[3] (NPPF) was published on 24th July 2018 (updated in 19th February 2019) and sets out the Government's core policies and principles with respect to land use planning, including air quality. The document includes the following considerations which are relevant to this assessment:

> *"Planning policies and decisions should contribute to and enhance the natural and local environment by:*
>
> *[…]*
>
> *Preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality.*
>
> *Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan."*

The implications of the NPPF and have been considered throughout this assessment.

2.4.2 National Planning Practice Guidance

The National Planning Practice Guidance[4] (NPPG) web-based resource was launched by the Department for Communities and Local Government on 6th March 2014 to support the NPPF and make it more accessible. The relevant air quality sections are highlighted below:

> Paragraph 001 states that: *"Defra carries out an annual national assessment of air quality using modelling and monitoring to determine compliance with EU Limit Values" and "It is important that the potential impact of new development on air quality is taken into account, where the national assessment indicates that relevant limits have been exceeded or are near the limit". The role of Local Authorities under LAQM are stated and that Air Quality Action Plans should "identify measures that will be introduced in pursuit of the objectives"*
>
> Paragraph 005 states that *"Whether or not air quality is relevant to a planning decision will depend on the proposed development and its location. Concerns could arise if the development*

[3] National Planning Policy Framework, Department for Communities and Local Government, 2019.
[4] http://planningguidance.planningportal.gov.uk/.

is likely to generate air quality impact in an area where air quality is known to be poor. They could also arise where the development is likely to adversely impact upon the implementation of air quality strategies and action plans and/or, in particular, lead to a breach of EU legislation"

Paragraph 007 states that *"Assessments should be proportional to the nature and scale of development proposed and the level of concern about air quality". In terms of mitigation, it states that "Mitigation options where necessary will be location specific, will depend on the proposed development and should be proportionate to the likely impact"*

Paragraph 009 shows a flow chart highlighting how the assessment of air quality impacts should fit into the development management process. It makes it clear that air quality impact risks, AQLVs and AQOs should be considered in the decision-making process.

These were reviewed and the relevant guidance considered as necessary throughout the undertaking of this assessment.

2.5 Kirklees Council Local Planning Policy

Kirklees Council (KC)[5] Local plan was adopted in February in 2019 and supersedes the Kirklees Unitary Development Plan. The Policies document provides a set of policies which will also provide the basis for determining detailed issues when dealing with planning applications.

A review of the Local Plan document indicated the following policies in relation to air quality that are relevant to this assessment:

"Policy PLP 15 – Residential use in town centres

Proposals for residential uses (including student accommodation) within the defined town centres as set out on the Policies Map will be supported subject to:

[…]

d. the protection of the amenity of existing residents and future occupiers of the proposed residential use in accordance with amenity and design policies within the plan, and will in particular consider matters such as privacy, noise and air quality;"

"*Policy PLP 20 – Sustainable Travel*

[…]

The council will support demand management measures which discourage single occupancy car travel within new development and encourage the use of low emission vehicles to improve area with low level of air quality. Proposals should include measures to encourage the use of sustainable travel options, including public transport, the promotion of personal journey planning, walking, cycling, car sharing, electronic communication and home working."

"Policy PLP 21 – Highway safety and access

Proposals shall demonstrate that they can accommodate sustainable modes of transport and

[5] Kirklees Local Plan, February 2019

be accessed effectively and safely by all users 106 Publication Draft Local Plan - Strategy and Policies 10 Transport

[…]

All proposals shall

[…]

c. be accompanied by a supporting Transport Assessment or Transport Statement where the development would generate significant trip generation, providing detail as to the impact on highway safety, air quality, noise and light restrictions"

"*Policy PLP 47 – Healthy, active and safe lifestyles*

Healthy, active and safe lifestyles will be enables by:

[…]

G – Ensuring that the current air quality in the district is monitored and maintained and, where required, appropriate mitigation measures included as part of new development proposals."

"*Policy PLP 51 – Protection and improvement of local air quality*

1. *Development will be expected to demonstrate that it is not likely to result, directly or indirectly, in an increase in air pollution which would unacceptably affect or cause a nuisance to the natural and built environment or to people.*

2. *Proposals that have the potential to increase local air pollution either individually or cumulatively must be accompanied by evidence to show that the impact of the development has been assessed in accordance with the relevant guidance. Development which has the potential to cause levels of local air pollution to increase to unsafe levels must incorporate sustainable mitigation measures that reduce this impact to a safe level. If sustainable measures cannot be introduced the development will not be permitted.*

3. *Where the development introduces new receptors into Air Quality Management Areas or Areas of Concern or near other areas of relatively poor air quality, for example near roads or junctions, the development must incorporate sustainable mitigation measures that protect the new receptors from unacceptable levels of air pollution. Where sustainable mitigation measures cannot be introduced which prevent receptors from being exposed to unsafe levels of air pollution, development will not be permitted.*"

Reference has been made to these policies during the undertaking of this Air Quality Assessment.

The Air Quality & Emissions Technical Planning Guidance[6] was prepared to support the air quality assessment process and advise mitigation measures. This document has also been taken into consideration within this assessment.

[6] Air Quality & Emissions Technical Planning Guidance, West Yorkshire Low Emissions Group, 2014.

3. METHODOLOGY

The proposed development has the potential to cause air quality impacts during the operational phase in addition to exposing future site users to elevated pollution levels. These issues have been assessed in accordance with the following methodology.

3.1 Construction Phase Assessment-

Given the change of use application, on site construction activities associated with the scheme will only consist of internal amendments. As a result, it is not anticipated that air quality impacts would arise as a result of construction phase emissions.

With minimal fugitive dust releases expected, a construction phase dust risk assessment has not been considered further in the preparation of the assessment

3.2 Operational Phase Assessment- West Yorkshire Planning Guidance

The development has the potential to impact on existing air quality as a result of road traffic exhaust emissions, such as NO_2, PM_{10} and $PM_{2.5}$, associated with vehicles travelling to and from the site. An assessment was therefore undertaken using the methodology contained within the West Yorkshire (WY) Air Quality and Emissions Technical Planning Guidance[7] to determine the potential for the development to affect local air quality.

The air quality assessment process follows a three-stage process:

- Stage 1: Determining the classification of the development proposal;
- Stage 2: Assessing and quantifying the impact on local air quality; and
- Stage 3: Determining the level of mitigation required by the proposal to meet Local Development Plan requirements.

3.2.1 Stage 1 - Development Type Classification

The three levels of development classification were determined using the Department for Transport (DfT) criteria[8]. These are outlined in Table 3.

Table 3 Criteria for Development Classification

Land Use	Description	Criteria
Residential Institutions (C2)	Hospitals, nursing homes used for residential accommodation and care	> 50 beds
Residential Institutions (C2)	Boarding schools and training centres	> 150 students
Residential Institutions (C2)	Institutional hostels, homeless centres	> 400 residents
Dwelling Houses (C3)	Dwellings for individuals, families or not more than six people in a single household	> 50 units

7 West Yorkshire, Air Quality and Emissions Technical Planning Guidance
8 http://webarchive.nationalarchives.gov.uk/20100409053417 http://www.dft.gov.uk/adobepdf/165237/202657/guidanceontaappendixb.

Land Use	Description	Criteria
Other: 1. Any development generating 30 or more two-way vehicle movements in any hour ***2***. Any developments generating 100 or more two-way vehicle movements per day 3. Any development proposing 100 or more parking spaces 4. Any relevant development proposed in a location where the local transport infrastructure is inadequate **5. Any relevant development proposed in a location adjacent to an AQMA**		

Additional Trigger Criteria for Major Developments

Table 4 Additional Trigger Criteria for Major Developments

Description
Where the proposed development falls within the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 2011 and includes air quality and/or transport as a specific likely impact;
Proposals located within an AQMA;
Proposals that could increase the existing traffic flow on roads of > 10,000 Annual Average Daily Traffic (AADT) by 5% or more;
Proposals that increase traffic 5% on road canyons with > 5,000 AADT;
Proposals that could introduce or significantly alter congestion (DfT Congestion) and includes the introduction of substantial road infrastructure changes;
Proposals that reduce average speeds by more than 10kph;
Proposals that include additional HDV movements by more than 10% of total trips; and
Where significant demolition and construction works are proposed.

The three levels of development classification are outlined in Table 5.

Table 5 Development Type Classification

Development Type Classification	Criteria
1. Minor	Development proposals that fall below the criteria detailed within Table 3
2. Medium	Development proposals that meet the requirements detailed within Table 3
3. Major	Development proposals that meet the requirements detailed within Table 3 and the additional trigger criteria for major developments detailed in Table 4

The proposed development does not satisfy any of the criteria listed in Table 3, but does exceeds one of additional trigger criteria *(Proposals located within an AQMA)* listed in Table 4. However, following consultation with KC it was agreed that the proposed development should be considered as a **Minor** proposal.

3.2.2 Stage 2 - Air Quality Impact Assessment

Minor and Medium Developments

The West Yorkshire guidance[7] requires an assessment of the likelihood of introducing additional exposure. The outcome of the exposure assessment will determine the level of mitigation required to make the development acceptable. This is determined by using the following criteria:

- **The proposal is adjacent to or within an AQMA;**
- The proposal is in a location 20m from roads[9] at or above the relevant national objective highlighted on the DEFRA GIS modelled maps[10];
- **The proposal is one of the Land Use types:**
  - **C1 to C3 in Table 3;**
  - C4 (Homes of Multiple Occupation); and
  - D1 in Table 3.
- **The proposal is within 20m of roads with > 10,000 AADT.**

The proposed development is located within the Kirklees AQMA 9, and within 20m of roads with >10,000 AADT. Consequently, an appropriate assessment of future exposure is required.

3.2.3 Stage 3 - Mitigation

Based on the findings of Stage 2 - Air Quality Impact Assessment, the level of air quality impact has been defined as **Minor** which is then used to determine the required level of mitigation to negate the potential effects of a development.

Minor Proposal - Type 1

If the proposal meets the exposure criteria in Stage 2, further mitigation is required to reduce the level of exposure. This will be in the form of:

- Possible short-term screening monitoring or utilising the DEFRA distance calculation[11] at the proposed location to identify the level of exposure;
- Redesigning the proposal to reduce the ingress of pollution; and
- Including a stand-off distance and/or vegetation boundary from the development.

The type specific default mitigation measures are detailed in Table 6.

Table 6 Type 1 - Minor Proposal Default Mitigation

Development	Mitigation
Residential	*1 charging point per unit (dwelling with dedicated parking) or 1 charging point per 10 spaces (unallocated parking)*
Heating	*All gas-fired boilers to meet a minimum standard of <40mgNOx/kWh*

9 NO_2 Concentrations and Distance from Roads, Air Quality Consultants, 2008.
10 (http://uk-air.defra.gov.uk/data/gismapping).
11 http://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html.

3.3 Road Traffic Exhaust Emission Impacts

The development has the potential to impact on existing air quality as a result of road traffic exhaust emissions, such as NO_2 and PM_{10}, associated with vehicles travelling to and from the site. A screening assessment was therefore undertaken using the criteria contained within the Environmental Protection UK (EPUK) and Institute of Air Quality Management (IAQM) 'Land-Use Planning & Development Control: Planning for Air Quality (2017)'[12] guidance documents to determine the potential for trips generated by the development to affect local air quality.

The EPUK and IAQM guidance[12] document states the following criteria to help establish when an air quality assessment is likely to be considered necessary:

- Proposals that will cause a change in Light Duty Vehicle (LDV) flows of more than 100 AADT within or adjacent to an AQMA or more than 500 elsewhere;
- Proposals that will cause a change in HDV flows of more than 25 AADT within or adjacent to an AQMA or more than 100 elsewhere;
- Proposals that would realign roads within an AQMA by more than 5m;
- Proposals that will introduce new junctions or remove existing junctions near relevant receptors;
- Proposals that will introduce or change a bus station or change flows of buses by more than 25 AADT within an AQMA or more than 100 AADT elsewhere;
- Proposals which will include an underground car park with extraction system which will be within 20m of a relevant receptor and have more than 100 movements per day;

Should these criteria not be met, then the EPUK and IAQM guidance[12] documents consider air quality impacts associated with a scheme to be **negligible** and no further assessment is required.

Should screening of the traffic data indicate that any of the above criteria are met, then potential impacts at sensitive receptor locations can be assessed by calculating the predicted change in pollutant concentrations as a result of the proposed development. The significance of predicted impacts can then be determined in accordance with the methodology outlined in the EPUK and IAQM guidance[12].

[12] Land-Use Planning & Development Control: Planning for Air Quality, EPUK and IAQM, January 2017.

4. BASELINE

Existing air quality conditions in the vicinity of the proposed development site were identified in order to provide a baseline for assessment. These are detailed in the following sections.

4.1 Local Air Quality Management

As required by the Environment Act (1995), KC has undertaken Review and Assessment of air quality within their area of administration. This process concluded that annual mean concentrations of NO_2 are above the AQO within the city. As such, 9 AQMAs have been declared, the closest of which is described as:

> *"Kirklees AQMA 9; the designated area incorporates Roads bordering and within the Huddersfield Ring Road"*

The site is located within Kirklees AQMA 9. As such, there is the potential for the development to cause potential impacts to air quality within this sensitive area, as a result of additional road vehicle exhaust emission generated during the development.

KC has concluded that concentrations of all other pollutants considered within the AQS are currently below the relevant AQOs and as such no further AQMAs have designated.

4.2 Air Quality Monitoring

Monitoring of pollutant concentrations is undertaken by KC using continuous and periodic methods throughout their area of administration. A review of KC's most recent Air Quality Annual Status Report indicated that there are two automatic analysers within their administration. The closest of which is located approximately 3.6km away from the site at NGR: 411739, 419007. Due to the distance between the development site and automatic analyser, similar pollutant concentrations would not be expected and as such, this monitoring station has not been considered further within this assessment.

KC also utilise passive diffusion tubes to monitor NO_2 concentrations throughout the borough. A review of the most recent monitoring data available indicated that there are six diffusion tube located within the vicinity of the site. Recent results are shown in Table 7. Exceedances of the annual mean AQO are highlighted in **bold**.

Table 7 Diffusion Tube Monitoring Results

ID	Site Name	Type	NGR (m)		Annual Mean NO_2 Concentration ($\mu g/m^3$)		
			X	Y	2015	2016	2017
2	Bus Station - Huddersfield	Other	414214	416504	**46.74**	**41.58**	**42.25**
7	Westgate, Huddersfield	Urban Centre	414434	416744	**44.81**	38.60	35.88
11	Chapel Hill, Huddersfield	Roadside	414389	416262	**42.40**	37.79	36.50
21	Castlegate Huddersfield	Roadside	414149	416686	**44.92**	**45.05**	**40.13**
28	Ring Road Huddersfield	Roadside	440531	373484	**54.68**	**53.13**	**55.94**
56	Wakefield Road, Huddersfield	Roadside	415009	416420	39.93	**40.00**	39.56

As indicated in Table 7, the annual mean AQO for NO_2 was exceeded at all the diffusion tube location in recent years. This is due to their location with an AQMA situated along the A62/Huddersfield Ring Road. Reference should be made to Figure 2 within Appendix I for a graphical representation of the diffusion tube locations.

4.3 Background Pollutant Concentrations

Predictions of background pollutant concentrations on a 1km by 1km grid basis have been produced by DEFRA for the entire of the UK to assist LAs in their Review and Assessment of air quality. The proposed development site is located in across three grid squares NGR: 414500, 416500. Data for these locations was downloaded from the DEFRA website[13] for the purpose of this assessment with the averaged concentrations summarised in Table 8 for the verification year (2017) and the predicted development opening year (2020).

Table 8 Predicted Background Pollutant Concentrations

Pollutant	Predicted Background Concentration (µg/m^3)	
	2017	2020
NO_x	34.62	30.11
NO_2	23.22	20.67
PM_{10}	13.62	13.21
$PM_{2.5}$	8.79	8.39

As shown in Table 8, background concentrations do not exceed the relevant AQOs. Comparison with the NO_2 monitoring results indicates the impact that vehicle exhaust emissions from the highway network have on pollutant concentrations at roadside locations.

[13] http://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html.

5. ASSESSMENT

There is the potential for air quality impacts as a result of the operation of the proposed development in addition to the exposure of future site users to elevated pollution levels. These are assessed in the following Sections.

5.2 Operational Phase Assessment

5.2.1 Future Exposure

The proposed development has the potential to expose future users to elevated pollution levels. This was assessed through detailed dispersion modelling, with the results presented in the following Sections.

The assessment considered the following scenarios:

- 2017 Verification; and
- 2020 Opening year.

For the purpose of this assessment traffic data representative of 2020, the development opening year, was used. Air quality is predicted to improve in the future. However, in order to provide a robust assessment, emission factors for 2017 were utilised within the dispersion model. The use of 2020 traffic data and 2020 emission factors is considered to provide a worst-case scenario and therefore a sufficient level of confidence can be placed within the predicted pollution concentrations.

Reference should be made to Appendix II for full assessment input details.

Nitrogen Dioxide (NO2) - Annual

Figure 4 within Appendix I display the contour plots for the predicted annual mean NO_2 concentrations at 4.6m which are representative of exposure across the first-floor level of the proposed development.

Predicted annual mean NO_2 concentrations across the first-floor level are summarised in Table 9.

Table 9 Predicted Annual Mean NO_2 Concentrations at the Development Site

Floor	Predicted 2020 Annual Mean NO_2 Concentration Range (µg/m^3)
First Floor (4.6m)	29.45 – 34.59

As indicated in Table 9, there were no predicted exceedances of the annual mean AQO at the proposed development site. As such, it is considered that annual mean NO_2 levels at the development site should not be viewed as a constraint to development.

It is considered that background NO_2 levels are likely to be lower at elevated heights due to increased distance from emission sources, such as the local road network. Therefore, predicted concentrations at heights above first floor level are deemed to be acceptable in relation to pollutant exposure and have not been considered further.

Predictions of 1-hour NO_2 concentrations were not produced as part of the dispersion modelling assessment. However, as stated in LAQM (TG16)[2] if annual mean NO_2 concentrations are below 60µg/m^3 then it is unlikely that the 1-hour AQO will be exceeded. As such based on the results in

Table 9, it is not predicted that concentrations will exceed the 1-hour mean AQO for NO_2 across the development site in the 2020 opening year scenario.

Based on the results of the dispersion modelling assessment, the site is considered to be suitable for the proposed end use without the implementation of mitigation techniques to protect future residents from elevated NO_2 concentrations.

Particulate Matter (PM_{10}) – Annual Mean

Figure 5 within Appendix I displays the contour plots for the predicted annual mean PM_{10} concentrations at 4.6m which is representative of exposure across the first-floor level of the proposed development. Predicted annual mean PM_{10} concentrations across the ground floor level are summarised in Table 10.

Table 10 Predicted Annual Mean PM_{10} Concentrations at the Development Site

Floor	Predicted 2020 Annual Mean PM_{10} Concentration Range (µg/m^3)
First Floor (4.6m)	14.11 – 14.58

As indicated in Table 10, there are no predicted exceedances of the annual mean AQO for PM_{10} across the proposed development. As such, it is considered that annual mean PM_{10} levels at the development site should not be viewed as a constraint to development.

Similar to NO_2 concentrations, PM_{10} levels are likely to be lower at elevated heights due to increased distance from emission sources, such as the local road network. Therefore, predicted concentrations at heights above first floor level are considered to be acceptable in regard to pollutant exposure and have not been assessed further.

Based on the results of the dispersion modelling assessment, the site is considered to be suitable for the proposed end use without the implementation of mitigation techniques to protect future residents from elevated PM_{10} concentrations.

Particulate Matter ($PM_{2.5}$) – Annual Mean

$PM_{2.5}$ has not been modelled within the assessment as the predicted concentrations relating to annual mean PM_{10} remain below the AQO for $PM_{2.5}$ (25µg/m^3).

Since PM_{10} accounts for all particulate matter with an aerodynamic diameter of less than 10µm, $PM_{2.5}$ is effectively included within these predictions; and at worst could be considered that $PM_{2.5}$ concentrations would be equal to the predicted PM_{10} concentrations.

5.2.2 Road Traffic Exhaust Emissions

Additional vehicle movements associated with the proposed development will generate exhaust emissions, such as NO_2, PM_{10}, and $PM_{2.5}$ on the local and regional road networks. The proposed development does not provide any associated on-site parking. As such the proposals are not anticipated to generate any additional vehicle trips on the local network per day.

Based on the above information, potential air quality impacts associated with operational phase road vehicle exhaust emissions are predicted to be **not significant**, in accordance with the EPUK and IAQM[12] screening criteria shown in Section 3.3.

5.3 West Yorkshire Planning Guidance

5.3.1 Stage 1 - Development Type Classification

The proposals comprise the development of the site to provide 12 student flats and associated infrastructure. According to the criteria detailed in Table 3 and Table 4 the proposal meets the criteria for a **Minor** development under land use C2.

5.3.2 Stage 2 - Air Quality Impact Assessment

The proposed development is classified as C3 Land Use, and located within 20m of Southgate A62, a major road link exceeding the threshold of 10,000 AADT as well as within the Kirklees AQMA 9. Subsequently, an air quality exposure impact assessment was required.

5.3.3 Stage 3 - Mitigation

Based on the recommendations of the West Yorkshire technical planning guidance[7] there are a number of air quality mitigation options available to off-set impacts associated with a **Minor** classified development. However, all techniques have financial implications and may therefore affect scheme viability. As such, they should only be included if necessary.

The Stage 2 (impact Assessment) indicated the requirement for mitigation measures in order to negate the impact of a development. The type specific default mitigation measures suggested by the guidance and listed in Table 11 and will contribute towards the reduction of emissions associated with the development.

Table 11 Type 1 - Default Mitigation

Development	Mitigation
Residential	*1 charging point per unit (dwelling with dedicated parking) or 1 charging point per 10 spaces (unallocated parking)* *All gas-fired boilers to meet a minimum of 40mg NO_x/kWh*

The above techniques are to be fully discussed with KC prior to the commencement of the proposed development. If deemed appropriate and can be suitably implemented into the scheme, this will further reduce the already non-significant impacts associated with the proposed development.

6. CONCLUSION

Resource and Environmental Consultants Ltd was commissioned by Horizon Accommodation Limited undertake an Air Quality Assessment in support of proposed student accommodation at Beast Market, Huddersfield.

An assessment was undertaken in accordance with the West Yorkshire Technical Planning guidance to determine the potential for the development to affect local air quality. This indicated that the development is considered to be classified as Type 1 - **Minor** development.

Dispersion modelling was undertaken in order to quantify pollutant concentrations at the site and assess potential exposure of future users. Concentrations of NO_2, and PM_{10} were predicted across the first floor level of the development and were subsequently verified using local monitoring results obtained from KC.

The dispersion modelling results indicated that pollutant levels at sensitive locations across the site were below the relevant AQOs. The location is therefore considered suitable for residential use without the inclusion of mitigation methods to protect future users from poor air quality

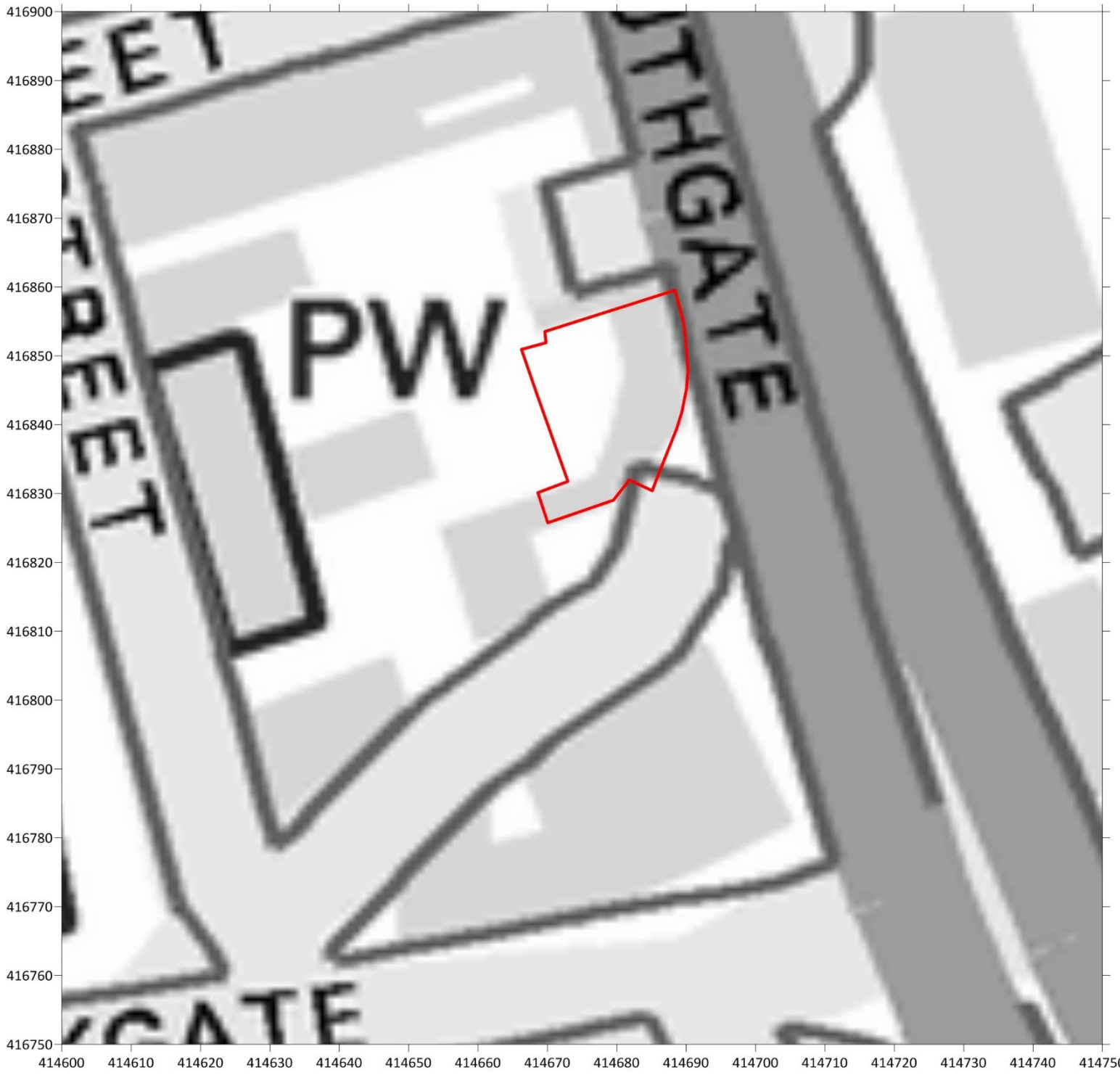
Potential impacts during the operational phase of the development may occur due to road traffic exhaust emissions. An assessment was therefore undertaken using the EPUK and IAQM[12] screening criteria to determine the potential for trips generated by the development to affect local air quality. This indicated that impacts are likely to be **not-significant** throughout the operational phase.

Based on the assessment results, the site is only considered suitable for residential use with the implementation of suitable mitigation measures.

7. ABBREVIATIONS

AADT	Annual Average Daily Traffic
ADM	Atmospheric Dispersion Modelling
AQAP	Air Quality Action Plan
AQLV	Air Quality Limit Value
AQMA	Air Quality Management Area
AQO	Air Quality Objectives
AQS	Air Quality Strategy
CERC	Cambridge Environmental Research Consultants
DEFRA	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
DMP	Dust Management Plan
DMRB	Design Manual for Roads and Bridges
EPUK	Environmental Protection UK
EU	European Union
HDV	Heavy Duty Vehicle
IAQM	Institute of Air Quality Management
KC	Kirklees Council
LA	Local Authority
LAQM	Local Air Quality Management
NGR	National Grid Reference
NO_2	Nitrogen dioxide
NO_x	Oxides of nitrogen
NPPF	National Planning Policy Framework
NPPG	National Planning Practice Guidance
$PM_{2.5}$	Particulate matter with an aerodynamic diameter of less than 2.5µm
PM_{10}	Particulate matter with an aerodynamic diameter of less than 10µm
REC	Resource and Environmental Consultants
TEMPRO	Trip End Model Presentation Program
WYPG	West Yorkshire Planning Guidance
z_0	Roughness Length

APPENDIX I - FIGURES



Legend

Site Boundary

Title

Figure 1

Site Location

Project

Air Quality Assessment
Beast Market, Huddersfield

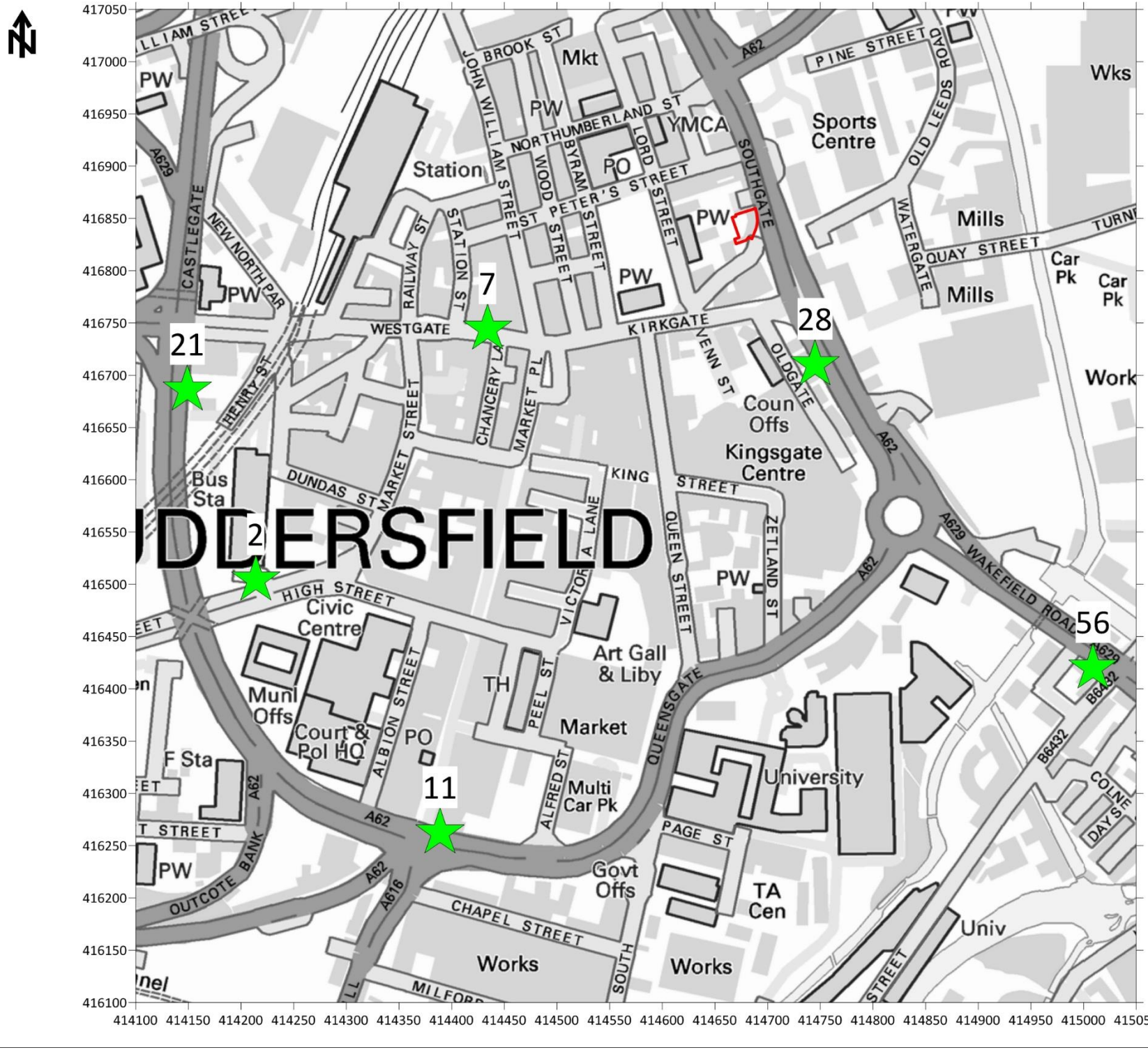
Project Number

AQ107409

Client

Horizon Accommodation Ltd

REC
Resource and Environmental Consultants Ltd
Osprey House, Broadway, Manchester M50 2UE
Tel – 0161 868 1300 Fax – 0161 868 1301
www.recltd.co.uk



Legend

Site Boundary

Diffusion Tube Monitoring Locations

Title

Figure 2

Diffusion Tube Monitoring Locations

Project

Air Quality Assessment
Beast Market, Huddersfield

Project Number

AQ107409

Client

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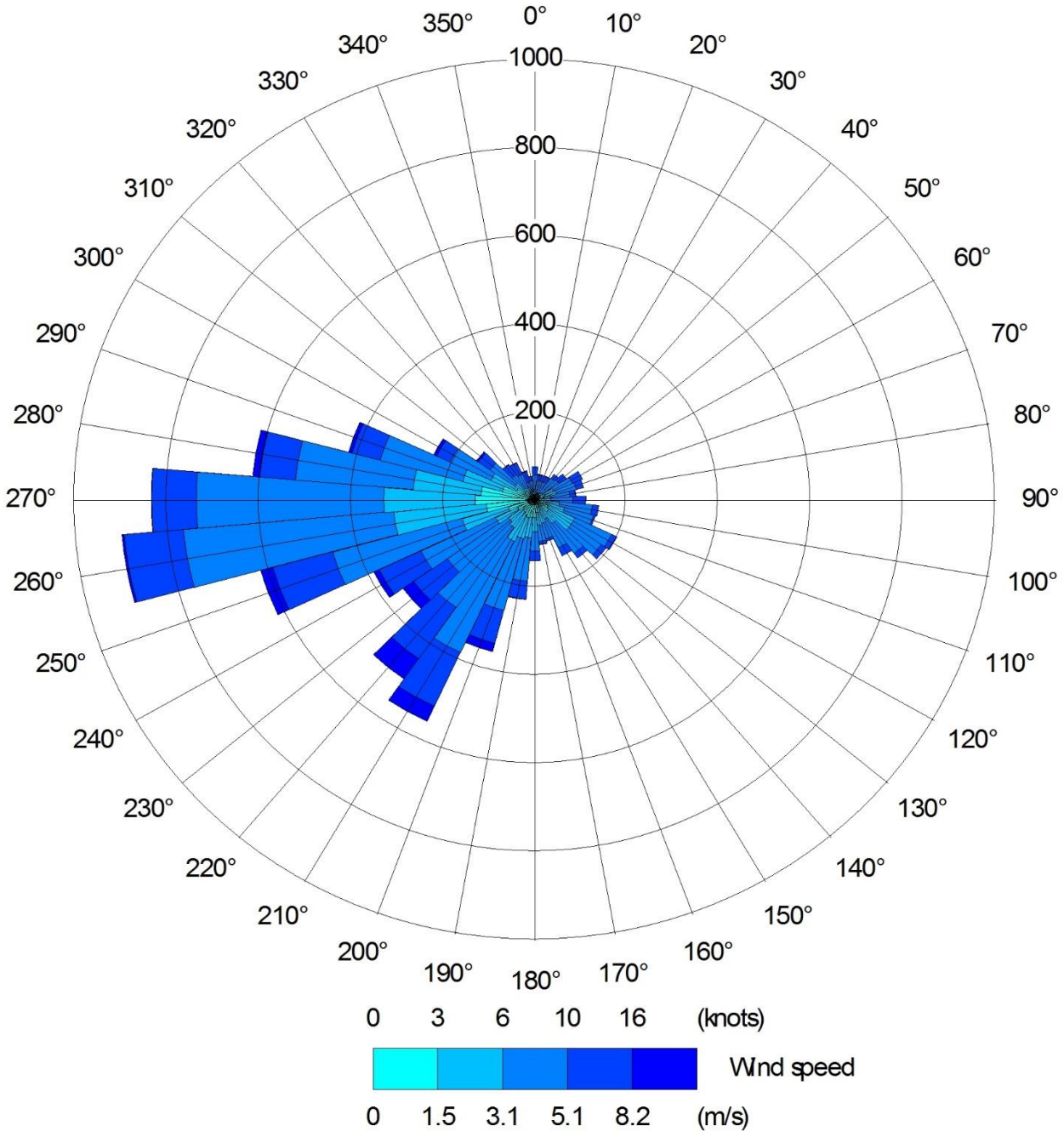

Title

Figure 3

Wind Rose 2017 Bingley Meteorological Station

Project

Air Quality Assessment
Beast Market, Huddersfield

Project Number

AQ107409

Client

Horizon Accommodation Ltd

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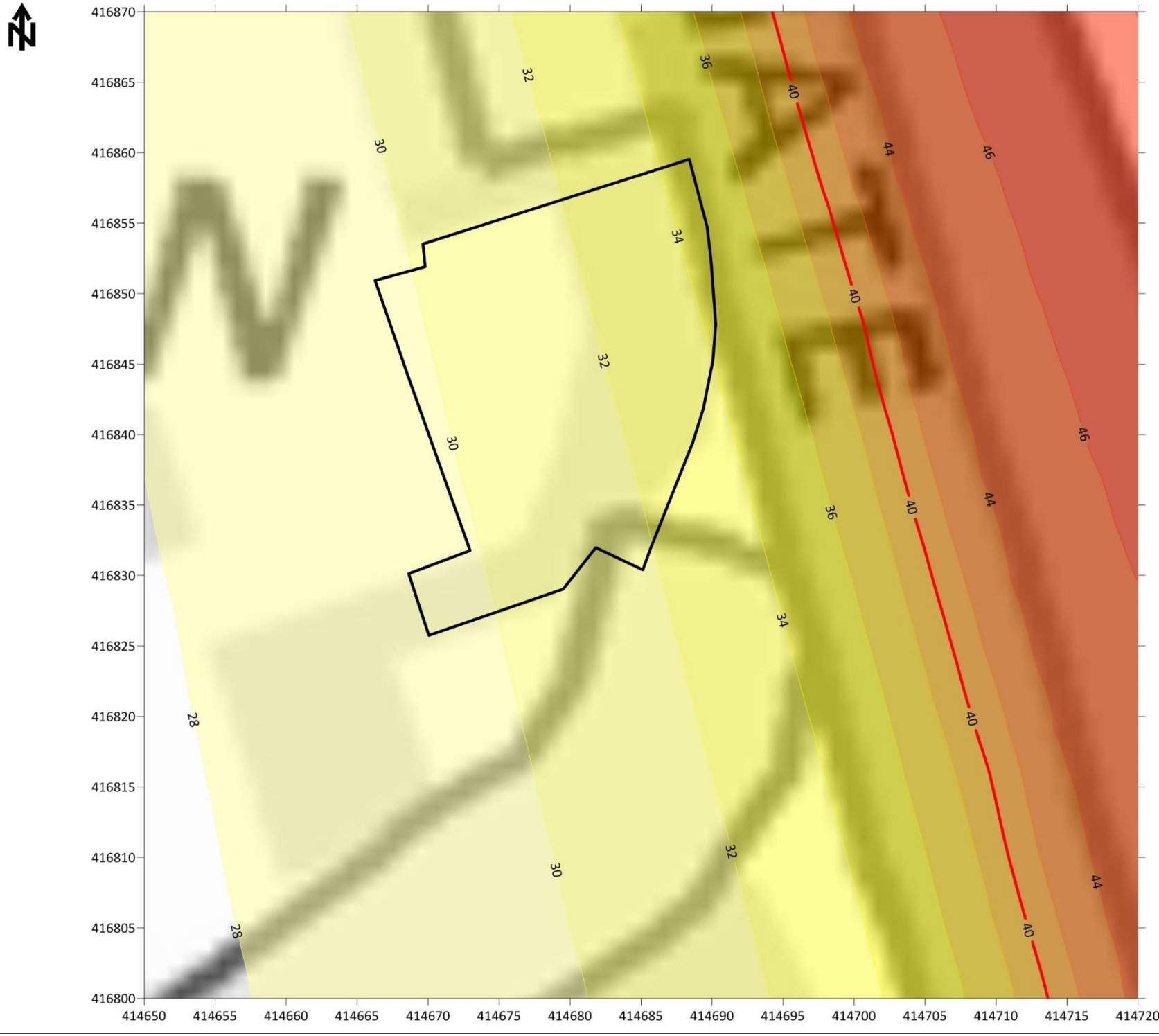

Legend

Site Boundary

48
46
44
42
40
38
36
34
32
30
28

Predicted Annual Mean NO_2 Concentration (µg/m³)

Title

Figure 4

Predicted Annual Mean NO_2 Concentrations (µg/m³) 2020 DS

First Floor (z= 4.6m)

Project

Air Quality Assessment
Beast Market, Huddersfield

Project Number

AQ107409

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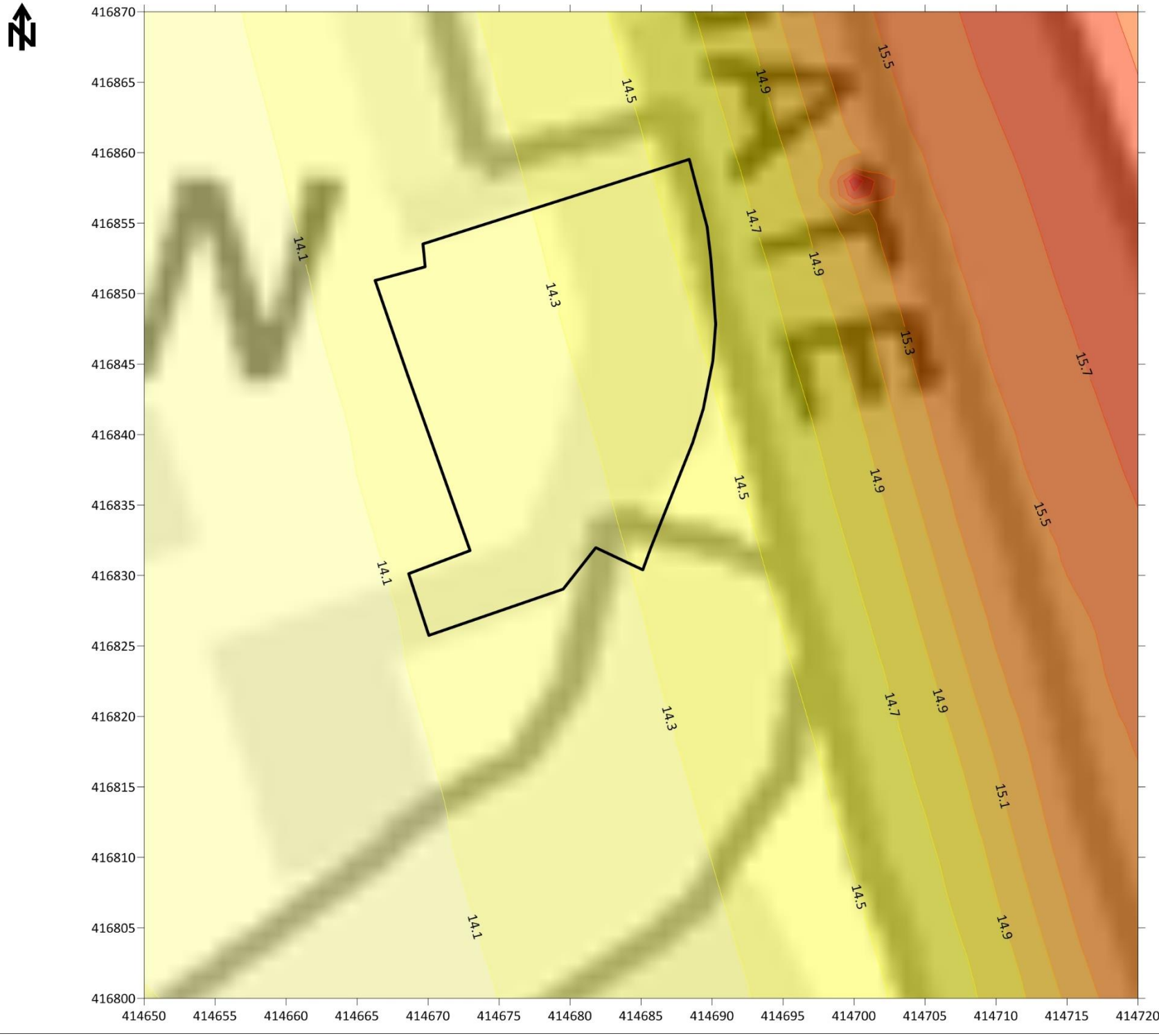

Legend

Site Boundary

15.9
15.7
15.5
15.3
15.1
14.9
14.7
14.5
14.3
14.1
13.9

Predicted Annual Mean PM_{10} Concentration ($\mu g/m^3$)

Title

Figure 5

Predicted Annual Mean PM_{10} Concentrations ($\mu g/m^3$) 2020 DS

First Floor (z= 4.6m)

Project

Air Quality Assessment
Beast Market, Huddersfield

Project Number

AQ107409

Client

Horizon Accommodation Ltd

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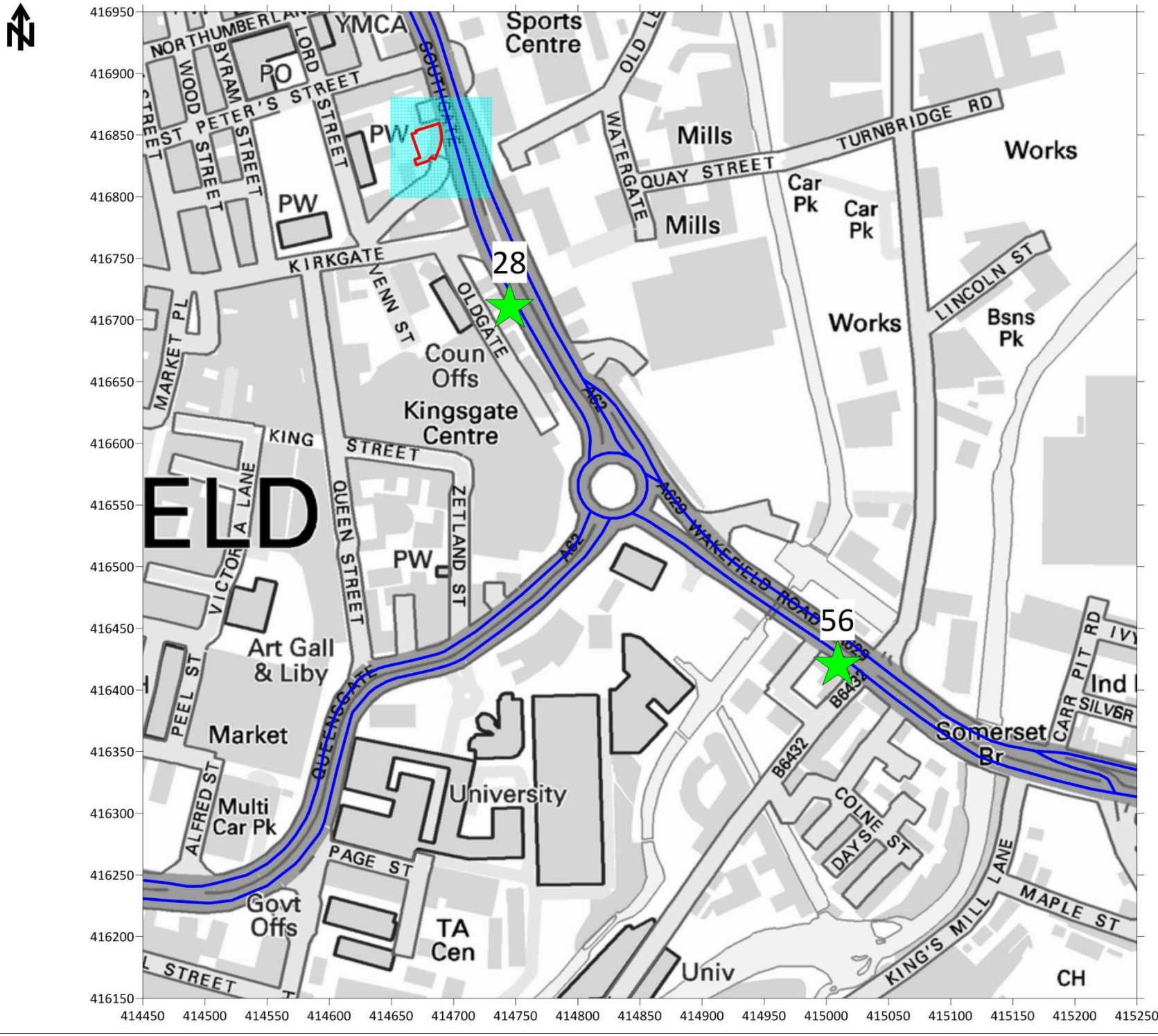

Legend

- Site Boundary
- Modelled Road Link
- Cartesian Grid
- Diffusion Tube Monitoring

Title

Figure 6

ADMS-Roads Input

Project

Air Quality Assessment
Beast Market, Huddersfield

Project Number

AQ107409

Client

Horizon Accommodation Ltd

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APPENDIX II - ASSESSMENT INPUTS

Assessment Inputs

The proposed development has the potential to expose future site users to elevated pollutant levels. In order to assess NO_2, PM_{10} and $PM_{2.5}$ concentrations across the site, detailed dispersion modelling was undertaken in accordance with the following methodology.

Dispersion Model

Dispersion modelling was undertaken using the ADMS-Roads dispersion model (version 4.0.1.0). ADMS-Roads is developed by Cambridge Environmental Research Consultants (CERC) and is routinely used throughout the world for the prediction of pollutant dispersion from road sources. Modelling predictions from this software package are accepted within the UK by the Environment Agency and DEFRA.

Input Data

The model requires input data that details the following parameters:

- Assessment area;
- Traffic flow data;
- Vehicle emission factors;
- Spatial co-ordinates of emissions;
- Street width;
- Meteorological data;
- Roughness length; and
- Monin-Obukhov length.

Assessment Area

Ambient concentrations were predicted over the proposed development site and surrounding highway network. One Cartesian grid with a resolution of 1.5m was included in the model over the area NGR: 414650, 416800 to 414720, 416870 at the following heights:

- 4.6m – First Floor;

Results were subsequently used to produce contour plots within the Surfer software package. It should be noted that although the grid only covered the proposed site, road links were extended in order to ensure the impact of all relevant vehicle emissions in the vicinity of the development were considered.

Reference should be made to Figure 6 within Appendix I for a graphical representation of the assessment grid extents.

Traffic Flow Data

Traffic data for use in the assessment, including 24-hour Annual Average Daily Traffic (AADT) flows and fleet composition, was obtained from the Department for Transport (DfT). The Dft Matrix web tool enables the user to view and download traffic flows on every link of the A-road and motorway network in Great Britain for the years 1999 to 2017. It should be noted that the DfT matrix is referenced in DEFRA guidance LAQM (TG16)[2] as being a suitable source of data for air quality assessments and is therefore considered to provide a reasonable representation of traffic flows in the vicinity of the site.

Growth factors provided by the Trip End Model Presentation Program (TEMPRO) software package were utilised to allow for conversion from the obtained 2017 traffic flow year to the 2020 opening year, which were used to represent the baseline verification year and development opening year, respectively.

Vehicle speeds were estimated based on the free flow potential of each link and local speed limits. Road widths were estimated from aerial photography and UK highway design standards. Reference should be made to Figure 6 within Appendix I for a graphical representation of the road link locations.

A summary of the traffic data used in the verification scenarios is provided in Table AII.1. Reference should be made to Figure 6 within Appendix I for Verification inputs.

Table AII.1 2017 Traffic Data

Road Link		Road Width (m)	Canyon height (m)	24-hour AADT Flow	HDV Prop (%)	Mean Vehicle Speed (km/h)
L1	Queensgate Southbound 2	11.80	0.0	14,722	3.25	40
L2	Queensgate Northbound	8.30	0.0	14,722	3.25	40
L3	Queensgate Northbound A62	7.20	0.0	14,722	3.25	40
L4	Queensgate Northbound A62 Slowdown	12.50	10.0	14,722	3.25	15
L5	Queensgate Southbound A62	7.20	10.0	14,722	3.25	40
L6	Queensgate Southbound Speedup	7.10	0.0	14,722	3.25	20
L7	Wakefield Road East 1	8.40	0.0	18,141	5.26	40
L8	Wakefield Road East 2	8.70	0.0	18,141	5.26	30
L9	Wakefield Road East 3	10.70	0.0	18,141	5.26	30
L10	Wakefield Road East 4	10.70	0.0	18,141	5.26	30
L11	Wakefield Road Slip	10.70	0.0	18,141	5.26	40
L12	Wakefield Road West 1	10.70	0.0	18,141	5.26	30
L13	Wakefield Road West 2	10.70	0.0	18,141	5.26	40
L14	Wakefield Road West 3	8.70	0.0	18,141	5.26	20
L15	Wakefield Road West	8.40	0.0	18,141	5.26	25
L16	Wakefield Road Slowdown to A62	12.50	0.0	18,141	5.26	15
L17	Queensgate Roundabout	10.90	0.0	24,794	3.61	20
L18	Southgate Southbound 1	9.60	0.0	16,726	3.96	25
L19	Southgate Southbound 2	8.50	0.0	16,726	3.96	15
L20	Southgate Southbound 3	9.60	0.0	16,726	3.96	30

Road Link		Road Width (m)	Canyon height (m)	24-hour AADT Flow	HDV Prop (%)	Mean Vehicle Speed (km/h)
L21	Southgate Southbound Slip to Roundabout	7.80	0.0	16,726	3.96	15
L22	Queensgate Roundabout Exit North	10.90	0.0	16,726	3.96	15
L23	Southgate Northbound 1	9.50	0.0	16,726	3.96	30
L24	Southgate Northbound Slowdown	9.14	0.0	16,726	3.96	15
L25	Southgate Northbound Speedup	7.36	0.0	16,726	3.96	20
L26	Southgate Northbound 2	7.00	0.0	16,726	3.96	25
L27	Viaduct Street Cross	10.00	0.0	9,414	1.85	30
L28	Southgate Northbound 3	11.60	0.0	9,414	1.85	40

The road width and mean vehicle speed shown in Table All.1 remained the same for development opening year scenario (2020). A summary of the 2020 traffic data is shown in Table All.2

Table All.2 2020 Traffic Data

Road Link		24-hour AADT Flow	HDV Prop. (%)
L1	Queensgate Southbound 2	15,007	3.25
L2	Queensgate Northbound	15,007	3.25
L3	Queensgate Northbound A62	15,007	3.25
L4	Queensgate Northbound A62 Slowdown	15,007	3.25
L5	Queensgate Southbound A62	15,007	4.25
L6	Queensgate Southbound Speedup	15,007	5.25
L7	Wakefield Road East 1	18,492	4.26
L8	Wakefield Road East 2	18,492	5.26
L9	Wakefield Road East 3	18,492	5.26
L10	Wakefield Road East 4	18,492	5.26
L11	Wakefield Road Slip	18,492	5.26
L12	Wakefield Road West 1	18,492	5.26
L13	Wakefield Road West 2	18,492	5.26
L14	Wakefield Road West 3	18,492	5.26
L15	Wakefield Road West	18,492	5.26

Road Link		24-hour AADT Flow	HDV Prop. (%)
L16	Wakefield Road Slowdown to A62	18,492	6.26
L17	Queensgate Roundabout	25,275	3.61
L18	Southgate Southbound 1	17,050	3.96
L19	Southgate Southbound 2	17,050	3.96
L20	Southgate Southbound 3	17,050	3.96
L21	Southgate Southbound Slip to Roundabout	17,050	3.96
L22	Queensgate Roundabout Exit North	17,050	3.96
L23	Southgate Northbound 1	17,050	3.96
L24	Southgate Northbound Slowdown	17,050	3.96
L25	Southgate Northbound Speedup	17,050	3.96
L26	Southgate Northbound 2	17,050	4.96
L27	Viaduct Street Cross	9,596	1.85
L28	Southgate Northbound 3	9,596	1.85

Emission Factors

Emission factors for each link were calculated using the relevant traffic flows and the Emissions Factor Toolkit (version 8.0.1) released in 2017, which incorporates updated COPERT5 vehicle emissions factors for NO_x and vehicle fleet information.

There is current uncertainty over NO_2 concentrations within the UK, with roadside levels not reducing as previously expected due to the implementation of new vehicle emission standards. Therefore, 2017 emission factors have been utilised for the prediction of pollution levels for all scenarios in preference to the development opening year (2020) in order to provide a robust assessment.

Meteorological Data

Meteorological data used in this assessment was taken from Bingley meteorological station over the period 1st January 2017 to 31st December 2017 (inclusive). Bingley meteorological station is located at approximate NGR: 408651, 435982, which is approximately 20.4km north of the proposed development.

All meteorological records used in the assessment were provided by Atmospheric Dispersion Modelling (ADM) Ltd, which is an established distributor of data within the UK. Reference should be made to Figure 5 within Appendix I for a wind rose of utilised meteorological data.

Roughness Length

A roughness length (z_0) of 1m was used in this dispersion modelling study. This value of z_0 is considered appropriate for the morphology of the assessment area and is suggested within ADMS-Roads as being

suitable for 'cities, woodlands'.

A z_0 of 0.3m was utilised to represent the morphology of the meteorological station location and is suggested as being suitable for 'agricultural areas (max)'.

Monin-Obukhov Length

The Monin-Obukhov length provides a measure of the stability of the atmosphere. A minimum Monin- Obukhov length of 30m was used in this dispersion modelling study. This value is considered appropriate for the nature of the assessment area.

A minimum Monin- Obukhov length of 10m was used for the meteorological station location and is suggested within ADMS-Roads as being suitable for 'cities and large towns'.

Background Concentrations

An annual mean NO_2 concentration of 23.22µg/m^3, a PM_{10} concentration of 13.62µg/m^3, and an annual mean $PM_{2.5}$ concentration of 8.79µg/m^{3}as predicted by DEFRA, was used in the dispersion modelling assessment to represent annual mean PM levels in the vicinity of the site.

As the monitoring location used in the verification process is located in different 1km grid squares, to that of the development site, predicted concentrations from the respective grid square were used to represent the background concentrations for the verification process. Table AII.3 displays the predicted background concentrations by DEFRA used in the verification process for the diffusion tube monitoring location.

Table AII.3 Predicted Diffusion Tube Monitoring Background Pollutant Concentrations

Receptor Grid Square	Diffusion Tubes	Pollutant	Predicted Background Concentration (µg/m^3)
			2017
414500, 416500	28	NO_x	34.62
		NO_2	23.22
415500, 416500	56	NO_x	29.19
		NO_2	20.03

Similar to emission factors, background concentrations for 2017 were utilised in preference to the development opening year. This provided a robust assessment and is likely to overestimate actual pollutant concentrations during the operational phase of the proposals.

NO_x to NO_2 Conversion

Predicted annual mean NO_x concentrations from the dispersion model were converted to NO_2 concentrations using the spreadsheet provided by DEFRA, which is the method detailed within LAQM (TG16)[2].

Verification

The predicted results from a dispersion model may differ from measured concentrations for a large number of reasons, including:

- Estimates of background concentrations;
- Uncertainties in source activity data such as traffic flows and emission factors;
- Variations in meteorological conditions;
- Overall model limitations; and
- Uncertainties associated with monitoring data, including locations.

Model verification is the process by which these and other uncertainties are investigated and where possible minimised. In reality, the differences between modelled and monitored results are likely to be a combination of all of these aspects.

For the purpose of this assessment model verification was undertaken for 2017, using traffic data, meteorological data and monitoring results from this year.

KC undertakes monitoring of NO_2 concentrations at two roadside location suitable for verification purposes within the assessment extents. The road contribution to total NO_x concentration was calculated from the monitored NO_2 result for use in the verification process. This was undertaken following the methodology contained within DEFRA guidance LAQM (TG16)[2].

The dispersion model was run with the traffic input data previously detailed for 2017 to predict the NO_x concentration at the monitoring locations. The results are shown in Table AII.4.

Table AII.4 NO_2 Verification Results

ID	Monitoring Location	Modelled Road NO_x Concentration (µg/m^3)	Monitored Road NO_x Concentration (µg/m^3)	Difference (%)
28	Ring Road Huddersfield	16.70	74.64	77.63
56	Wakefield Road, Huddersfield	19.80	40.89	51.58

The monitored and modelled NO_x road contribution concentrations were graphed and the equation of the trendline based on the linear progression through zero was calculated, as shown in Graph 1. This indicated that a verification factor of **3.0646** was required to be applied to all NO_x modelling results.

Graph 1 - NO_x Verification Factor

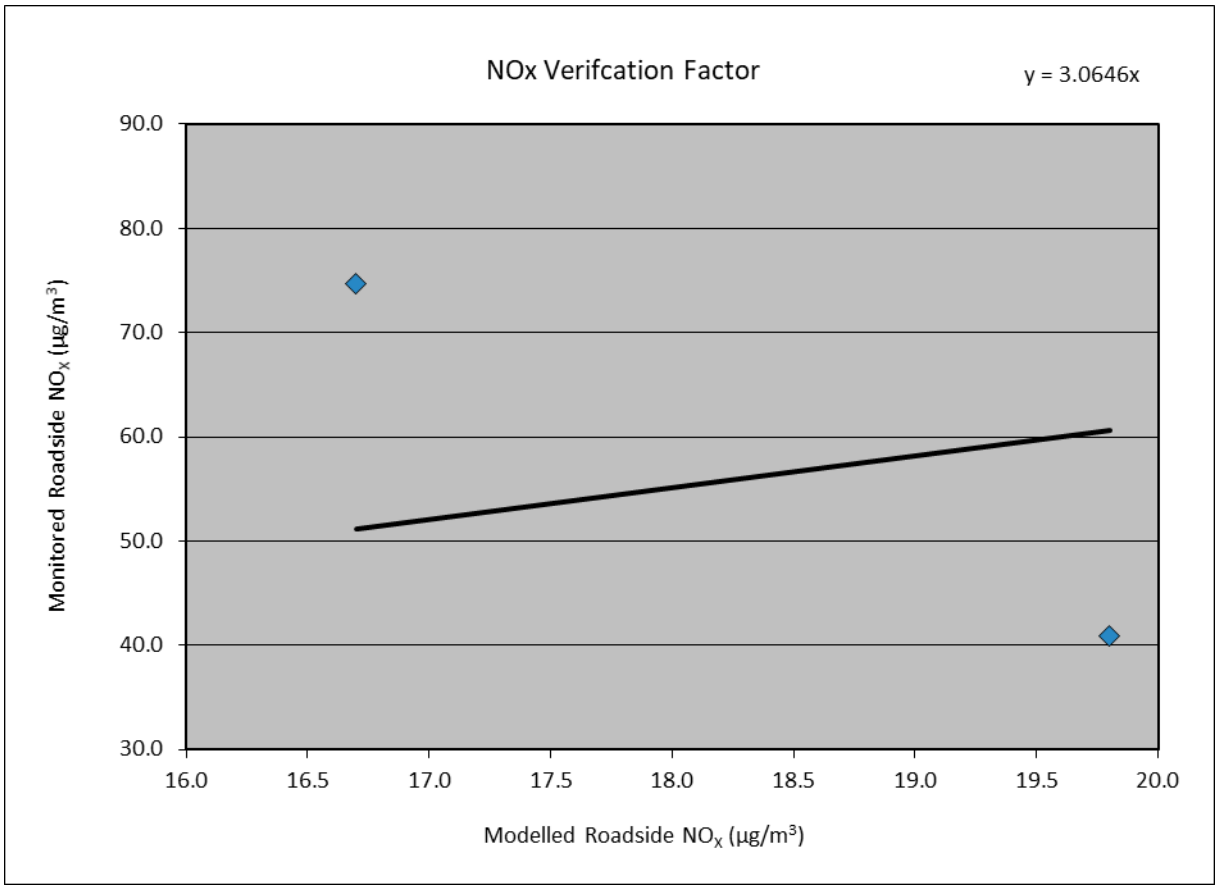

Table AII.5 presents the monitored annual mean NO_x concentrations and the adjusted modelled total NO_2 concentration based on the above verification factor. Exceedances of the relevant AQO are highlighted in **bold.**

Table AII.5 2017 NO_2 Monitoring Results

ID	Monitoring Location	Monitored NO_2 Concentration ($\mu g/m^3$)	Adjusted Modelled Total NO_2 Concentration ($\mu g/m^3$)	Difference (%)
28	Ring Road Huddersfield	**55.94**	**46.65**	16.39
56	Wakefield Road, Huddersfield	39.56	**47.91**	-20.78

As PM_{10} and $PM_{2.5}$ monitoring is not undertaken within the assessment extents, the NO_2 adjustment factor of **3.0646** was utilised to adjust model predictions of particulate matter in accordance with the guidance provided within LAQM (TG16)[2].

APPENDIX III ASSESSOR'S CURRICULUM VITAE

RACHEL HARRISON

Graduate Air Quality Consultant

BSc (Hons).

KEY EXPERIENCE:

Rachael is a Graduate Environmental Consultant with specialist experience in the air quality sector. Her key capabilities include:

- Production of Air Quality Assessments to the Department for Environment, Food and Rural Affairs (DEFRA), Environment Agency and Environmental Protection UK (EPUK) methodologies for clients from the residential, retail and commercial sectors.
- Detailed dispersion modelling of road vehicle emissions using ADMS-Roads. Studies have included impact assessment of pollutant concentrations at various floor levels and assessment of suitability of development sites for proposed end-use.
- Assessment of road vehicle exhaust emissions using the Design Manual for Roads and Bridges (DMRB) calculation spreadsheet.
- Assessment of dust impacts from construction sites to the Institute of Air Quality Management (IAQM) methodology.
- Production of air quality mitigation strategies for developments throughout the UK.
- Defining baseline air quality conditions and identification of sensitive areas.

QUALIFICATIONS:

- Bachelor of Science

KEY EXPERIENCE:

Rachael is a Graduate Environmental Consultant with specialist experience in the air quality sector. Her key capabilities include:

- Production of Air Quality Assessments to the Department for Environment, Food and Rural Affairs (DEFRA), Environment Agency and Environmental Protection UK (EPUK) methodologies for clients from the residential, retail and commercial sectors.
- Detailed dispersion modelling of road vehicle emissions using ADMS-Roads. Studies have included impact assessment of pollutant concentrations at various floor levels and assessment of suitability of development sites for proposed end-use.
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- Assessment of dust impacts from construction sites to the Institute of Air Quality Management (IAQM) methodology.
- Production of air quality mitigation strategies for developments throughout the UK.
- Defining baseline air quality conditions and identification of sensitive areas.

QUALIFICATIONS:

- Bachelor of Science

KEY EXPERIENCE:

Rachael is a Graduate Environmental Consultant with specialist experience in the air quality sector. Her key capabilities include:

- Production of Air Quality Assessments to the Department for Environment, Food and Rural Affairs (DEFRA), Environment Agency and Environmental Protection UK (EPUK) methodologies for clients from the residential, retail and commercial sectors.
- Detailed dispersion modelling of road vehicle emissions using ADMS-Roads. Studies have included impact assessment of pollutant concentrations at various floor levels and assessment of suitability of development sites for proposed end-use.
- Assessment of road vehicle exhaust emissions using the Design Manual for Roads and Bridges (DMRB) calculation spreadsheet.
- Assessment of dust impacts from construction sites to the Institute of Air Quality Management (IAQM) methodology.
- Production of air quality mitigation strategies for developments throughout the UK.
- Defining baseline air quality conditions and identification of sensitive areas.

QUALIFICATIONS:

- Bachelor of Science

JOSHUA DAVIES

Senior Air Quality Consultant

BSc (Hons) AMIEnvSc

KEY EXPERIENCE:

Josh is an Environmental Consultant with specialist experience in the air quality sector. HIs key capabilities include:

- Production of Air Quality Assessments to the Department for Environment, Food and Rural Affairs (DEFRA), Environment Agency and Environmental Protection UK (EPUK) methodologies for clients from the residential, retail and commercial sectors.
- Detailed dispersion modelling of road vehicle emissions using ADMS-Roads. Studies have included impact assessment of pollutant concentrations at various floor levels and assessment of suitability of development sites for proposed end-use.
- Assessment of road vehicle exhaust emissions using the Design Manual for Roads and Bridges (DMRB) calculation spreadsheet.
- Assessment of dust impacts from construction sites to the Institute of Air Quality Management (IAQM) methodology.
- Production of air quality mitigation strategies for developments throughout the UK.
- Defining baseline air quality conditions and identification of sensitive areas.

QUALIFICATIONS:

- Bachelor of Science
- Member of the Institute of Environmental Science (IES)

SELECT PROJECTS SUMMARY:

Residential Developments

Back Lane, Congleton - AQA for a residential development of 140 dwellings.
Helenvale Newbank -AQA for a residential development in the city wide Glasgow AQMA.
Chestnut Tree Farm, Twigworth - AQA for a residential development
Radwinter Road, Saffron Walden - AQA in close proximity to and AQMA.
Sutton Way -AQA for a residential development in close vicinity to the Whitby Road AQMA
Chester Road, Manchester - EIA for a large scale mixed use multi storey building, within close vicinity to an AQMA.
Newton Farm, Perth - EIA for a medium scale residential development in close vicinity to the A9.
Norwich Road, Attleborough - AQA for large scale residential development of 350 dwellings.
Carleton Village, Penrith - AQA for a residential development, in line with Eden Councils Local Plan.
Fairfax Steet, Coventry - Exposure assessment for Coventry University student accommodation.
Nags Head, Urmston - AQA for small residential development in vicinity to the Trafford AQMA.

Odour Assessments

Cedars Park, Stowmarket - Quantitative assessment in support of a large scale residential development in close proximity to Stowmarket Sewage Treatment Works

Clipsone House Farm – Quantitative odour and ammonia assessment in support of a proposed extension to a large scale poultry farm.

SELECT PROJECTS SUMMARY:

London Borough of Southwark Experience

Camberwell Road, Southwark - Exposure assessment for a proposed gym within an AQMA, 24 hour and 1 hour mean AQOs assessed.
Pelier Street- AQA for a residential development located within the Southwark AQMA
Haddonfield Estate - AQA for a residential development located within the Southwark AQMA
Goschen Estate - AQA for a medium scale residential development located within the Southwark AQMA
Lavington Street - AQA for mixed use scheme in AQMA in Southwark, including an AQN assessment.
Rye Lane - AQA for a residential development within the Southwark AQMA
Commercial Way - AQA for a residential development within the Southwark AQMA
Daniels Road - AQA for a residential development within the Southwark AQMA

Educational Developments

Brinsworth Comprehensive School, Rotherham - Baseline and Construction phase assessment related to a planning application for an extension and new Sports Hall. The site suitability was assessed due to the Schools close proximity to the M1 Motorway.
St Marys and Johns CE School, Barnet - AQA for the refurbishment of the existing school and the construction of a 3 storey classroom block, within the borough wide Barnet AQMA.
St Peters Catholic School, Guildford - AQA for the redevelopment of the existing site, and the construction of a two storey classroom block.

Monitoring Experience

Co-ordination and management of NO_2 diffusion tube monitoring surveys in accordance with DEFRA guidance.