

Odour Assessment
Lindley Moor Road, Lindley

Client: 2SH Developments

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Executive Summary

Redmore Environmental Ltd was commissioned by 2SH Developments to provide an Odour Assessment in support of a mixed-use development on land off Lindley Moor Road, Lindley.

The proposals include provision of a restaurant. Concerns have been raised that odour emissions from this premises may have the potential affect amenity levels at sensitive locations in the vicinity of the site. An Odour Assessment was therefore undertaken in order to consider effects associated with the scheme.

The risk of potential odour impact was assessed using a standard industry method. This involved consideration of a number of factors relating to the development, including the scale and nature of the potential emissions, location of the nearest receptors, the prevailing meteorological conditions and the proposed control measures.

Following consideration of the relevant factors, overall effects as a result of emissions associated with the development were predicted to be not significant. As such, potential odour impacts are not considered to represent a constraint to the proposals.

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1.0 INTRODUCTION

1.1 Background

- 1.1.1 Redmore Environmental Ltd was commissioned by 2SH Developments to provide an Odour Assessment in support of a mixed-use development on land off Lindley Moor Road, Lindley.
- 1.1.2 The proposals include provision of a restaurant. Concerns have been raised that odour emissions from this premises may have the potential affect amenity levels at sensitive locations in the vicinity of the site. An Odour Assessment was therefore undertaken in order to consider effects associated with the scheme.

1.2 Site Location and Context

- 1.2.1 The proposed development is located on land off Lindley Moor Road, Lindley at approximate National Grid Reference (NGR): 410892, 419008. Reference should be made to Figure 1 for a map of the site and surrounding area.
- 1.2.2 The proposals comprise the construction of 15 units covering land use classes B2, B8, E(b) and E(g) along with associated infrastructure. Of the 15 units, Plot C will comprise a restaurant.
- 1.2.3 A pre-application response produced by Kirklees Council (KC)¹ in relation to the development highlighted concerns in regards the potential for odour emissions to affect amenity levels at sensitive locations in the vicinity of the site. An Odour Assessment has therefore been undertaken in order to consider potential effects associated with the scheme. The findings are detailed in the following report.

¹ Pre-Application Response (Reference: 2020/20447), KC, 2021.

2.0 ODOUR BACKGROUND

2.1 Odour Definition

2.1.1 The Institute of Air Quality Management (IAQM) guidance² defines odour as:

"[...] the human olfactory response (perception followed by psychological appraisal) to one, or more often a complex mixture of, chemical species in the air."

2.1.2 The stated definition is considered to be relevant in the context of this assessment.

2.2 Odour Impacts

2.2.1 The magnitude of odour impact depends on a number of factors and the potential for complaints varies due to the subjective nature of odour perception. The **FIDOL** acronym (also stated as **FIDOR** in Environment Agency (EA) guidance³) is a useful reminder of the factors that will determine the degree of odour pollution. These are described by the IAQM⁴ as follows:

- **F**requency - how often an individual is exposed to odour;
- **I**ntensity - the individual's perception of the strength of the odour;
- **D**uration - The overall duration that individuals are exposed to an odour over time;
- **O** odour unpleasantness - Odour unpleasantness describes the character of an odour as it relates to the 'hedonic tone' (which may be pleasant, neutral or unpleasant) at a given odour concentration/ intensity. This can be measured in the laboratory as the hedonic tone, and when measured by the standard method and expressed on a standard nine-point scale it is termed the hedonic score; and,
- **L**ocation - The type of land use and nature of human activities in the vicinity of an odour source. Tolerance and expectation of the receptor. The 'Location' factor can be considered to encompass the receptor characteristics, receptor sensitivity, and socio-economic factors.

² Guidance on the Assessment of Odour for Planning v1.1, IAQM, 2018.

³ H4: Odour Management, EA, 2011.

⁴ Guidance on the Assessment of Odour for Planning v1.1, IAQM, 2018.

2.2.2 It is important to note that even infrequent emissions may cause loss of amenity if odours are perceived to be particularly intense or offensive.

2.2.3 The **FIDOL** factors can be further considered to provide the following issues in regard to the potential for an odour emission to cause a nuisance:

- The rate of emission of the compound(s);
- The duration and frequency of emissions;
- The time of the day that this emission occurs;
- The prevailing meteorology;
- The sensitivity of receptors to the emission i.e. whether the odorous compound is more likely to cause nuisance, such as the sick or elderly, who may be more sensitive;
- The odour detection capacity of individuals to the various compound(s); and,
- The individual perception of the odour (i.e. whether the odour is regarded as unpleasant). This is greatly subjective and may vary significantly from individual to individual. For example, some individuals may consider some odours as pleasant, such as petrol, paint and creosote.

2.3 **Odour Legislative Control**

2.3.1 The main requirement with respect to odour control from premises not controlled under the Environmental Permitting (England and Wales) Regulations (2016) and subsequent amendments, such as the proposed restaurant, is that provided in Section 79 of Part III of the Environmental Protection Act (1990). The Act defines nuisance as:

"Any dust, steam, odour or other effluvia arising on industrial, trade or business premises and being prejudicial to health or a nuisance."

2.3.2 Enforcement of the Act, in regard to nuisance, is currently under the jurisdiction of the local Environmental Health Department, whose officers are deemed to provide an independent evaluation of nuisance. If the Local Authority is satisfied that a statutory nuisance exists, or is likely to occur or happen again, it may serve an Abatement Notice under Part III of the Environmental Protection Act (1990). The only defence is to show that the process to which the nuisance has been attributed and its operation are being controlled according to best practicable means.

2.3.3 The legislative controls described above were considered as necessary throughout the undertaking of this assessment.

2.4 National Planning Policy

2.4.1 The revised National Planning Policy Framework⁵ (NPPF) was published in December 2023 and sets out the Government's planning policies for England and how these are expected to be applied.

2.4.2 The purpose of the planning system is to contribute to the achievement of sustainable development. In order to ensure this, the NPPF recognises three overarching objectives, including the following of relevance to odour:

"c) An environmental objective - to protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy"

2.4.3 Chapter 12 of the NPPF details objectives in relation to achieving well-designed place. It states that:

"Planning policies and decisions should ensure that developments

f) create places that are safe, inclusive and accessible and which promote health and well-being, with a high standard of amenity for existing and future users; and where crime and disorder, and the fear of crime, do not undermine the quality of life or community cohesions and resilience."

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

⁵ NPPF, Ministry of Housing, Communities and Local Government, 2023.

2.5 **Local Planning Policy**

2.5.1 The Kirklees Local Plan (KLP)⁶ was adopted by KC on 27th February 2019. The KLP sets out the spatial vision and strategy for Kirklees for the period up to 2031 and is used to guide decisions on planning, development and regeneration.

2.5.2 A review of the document indicated the following policy which is of relevance to this assessment:

"Policy LP52: Protection and Improvement of Environmental Quality

Proposals which have the potential to increase pollution from noise, vibration, light, dust, odour, shadow flicker, chemicals and other forms of pollution or to increase pollution to soil or where environmentally sensitive development would be subject to significant levels of pollution, must be accompanied by evidence to show that the impacts have been evaluated and measures have been incorporated to prevent or reduce the pollution, so as to ensure it does not reduce the quality of life and well-being of people to an unacceptable level or have unacceptable impacts on the environment.

Such developments which cannot incorporate suitable and sustainable mitigation measures which reduce pollution levels to an acceptable level to protect the quality of life and well-being of people or protect the environment will not be permitted.

Where possible, all new development should improve the existing environment."

2.5.3 The above policy has been considered throughout the undertaking of this assessment.

⁶ Kirklees Local Plan, KC, 2019.

2.6 Institute of Air Quality Management Guidance

- 2.6.1 The IAQM published the 'Guidance on the Assessment of Odour for Planning'⁷ document on 20th May 2014. This was updated in 2018⁸ and specifically deals with assessing odour impacts for planning purposes, namely potential effects on amenity. The assessment methodology outlined in the guidance has been utilised in throughout this report where relevant.

⁷ Guidance on the Assessment of Odour for Planning, IAQM, 2014.

⁸ Guidance on the Assessment of Odour for Planning v1.1, IAQM, 2018.

3.0 **METHODOLOGY**

3.1 **Introduction**

3.1.1 Emissions associated with the proposed restaurant have the potential to cause impacts at sensitive locations. The potential risk of adverse effects has therefore been assessed using the IAQM 'Guidance on the Assessment of Odour for Planning v1.1'⁹ document, as summarised in the following Sections.

3.2 **Background**

3.2.1 The basic concept of risk assessment is that the overall risk depends on the probability of an event occurring together with the likely consequences if it was to occur. For odour assessments the probability can be considered as the likelihood of exposure (impact), and the consequence can be considered to be the effect on the receptor if that exposure (impact) took place. These two facets can be summarised by the source-pathway-receptor concept.

3.2.2 Behind the source-pathway-receptor concept, is the fundamental relationship:

$$\text{Effect} \approx \text{Dose} \times \text{Response}$$

3.2.3 In the specific case of odour assessments, the dose can be considered equivalent to the odour exposure, or impact. This will be determined by **FIDO** of the **FIDOL** factors. The effect is the result of the changes on specific receptors (people in the case of odour) taking into account their sensitivities (i.e. responsiveness to odour), the L (location) in **FIDOL** is to categorise the sensitivity.

3.2.4 The IAQM guidance states that a qualitative risk-based approach is appropriate for:

- Screening of odour impacts;
- Development proposals likely to have a low risk of adverse effects;
- Situations where there is insufficient information to carry out detailed predictive dispersion modelling;

⁹ Guidance on the Assessment of Odour for Planning v1.1, IAQM, 2018.

- Situations where the information has wide uncertainties and its use as input to a detailed predictive dispersion model would be at best a waste of time, money and effort or, worse, would lead to an illusory and false impression of accuracy and precision in the numbers generated; and,
- When the model is not able to properly represent the reality of the situation being assessed, e.g. if the odour effects are likely to be significantly influenced by accidental, unexpected, or unknown releases. In such instances a qualitative estimate may be more appropriate, on the basis that it is better to be broadly correct than precisely wrong.

3.2.5 It is considered that the third, fourth and fifth of these criteria are met for this project. As such, a qualitative assessment methodology was deemed appropriate.

3.3 Risk Assessment Procedure

3.3.1 The first step in the assessment is to estimate the odour generating potential of the site activities. This is termed the Source Odour Potential, which takes into account three factors:

- The scale (magnitude) of the release from the odour source, taking into account the effectiveness of any odour control or mitigation measures that are already in place. This involves judging the relative size of the release rate after mitigation and taking account of any pattern of release (e.g. intermittency);
- How inherently odorous the emission is. In some cases it may be known whether the release has a low, medium or high Odour Detection Threshold (ODT). This is the concentration at which an odour becomes detectable to the human nose. In most instances the odours released by a source will be a complex mixture of compounds and the detectability will not be known. However, for some industrial processes the odour will be due to one or a small number of known compounds and the detection thresholds will be a good indication of whether the release is highly odorous or mildly odorous; and,
- The relative pleasantness/unpleasantness of the odour.

3.3.2 Using the example risk ranking in Table 1, the Source Odour Potential can be categorised as **small**, **medium** or **large**.

Table 1 Source Odour Potential

Source Odour Potential	Comments
Large	Magnitude - Larger Environmentally Permitted processes of odorous nature or large Sewage Treatment Works (STWs); materials usage hundreds of thousands of tonnes/m³ per year; area sources of thousands of m². The compounds involved are very odorous (e.g. mercaptans), having very low ODTs where known Unpleasantness - processes classed as "Most offensive" in EA Guidance H4¹⁰; or (where known) compounds/odours having unpleasant (-2) to very unpleasant (-4) hedonic score Mitigation/control - open air operation with no containment, reliance solely on good management techniques and best practice
Medium	Magnitude - Smaller Environmentally Permitted processes or small STWs; materials usage thousands of tonnes/m³ per year; area sources of hundreds of m². The compounds involved are moderately odorous Unpleasantness - processes classed in EA Guidance H4 as "Moderately offensive"; or (where known) odours having neutral (0) to unpleasant (-2) hedonic score Mitigation/control - some mitigation measures in place, but significant residual odour remains
Small	Magnitude - Falls below Environmental Permit Part B threshold; materials usage hundreds of tonnes/m³ per year; area sources of tens m². The compounds involved are only mildly odorous, having relatively high ODTs where known Unpleasantness - processes classed as "Less offensive" in EA Guidance H4; or (where known) compounds/odours having neutral (0) to very pleasant (+4) hedonic score Mitigation/control - effective, tangible mitigation measures in place leading to little or no residual odour

3.3.3 The next step is to estimate the effectiveness of the pollutant pathway as the transport mechanism for odour through the air to the receptor, versus the dilution/dispersion in the atmosphere. Any factor that increases dilution and dispersion of the plume as it travels from source to receptor will reduce the concentration at the end point, and hence reduce exposure. Important factors for consideration are:

- The distance between sensitive receptors and the odour source;
 - Whether receptors are downwind with respect to the prevailing wind direction.
- Odour episodes often tend to occur during stable atmospheric conditions with low wind speed, which gives poor dispersion and dilution. Receptors close to the source

¹⁰ H4: Odour Management, EA, 2011.

in all directions can be affected under these conditions. When circumstances are not calm, it will be the downwind receptors that are affected. As such, receptors that are downwind with respect to the prevailing wind direction tend to be at higher risk of odour impact;

- The effectiveness of the point of release in promoting good dispersion e.g. releasing emissions from a high stack will increase the pathway, dilution and dispersion; and,
- The topography and terrain between the source and receptor. The presence of topographical features such as hills and valleys, or urban terrain features such as buildings, can affect air flow and therefore increase, or inhibit, dispersion and dilution.

3.3.4 Using the example risk ranking in Table 2, the pollutant pathway from source to receptor can be categorised as **ineffective**, **moderately effective** or **highly effective**.

Table 2 Pathway Effectiveness

Pathway Effectiveness	Comments
Highly effective	Distance - receptor is adjacent to the source/site; distance well below any official set-back distances Direction - high frequency of winds from source to receptor, or, qualitatively, receptors downwind of source with respect to prevailing wind Effectiveness of dispersion/dilution - open processes with low-level releases, e.g. lagoons, uncovered effluent treatment plant, landfilling of putrescible wastes
Moderately effective	Distance - receptor is local to the source Where mitigation relies on dispersion/dilution - releases are elevated, but compromised by building effects
Ineffective	Distance - receptor is remote from the source; distance exceeds any official set-back distances Direction - low frequency of winds from source to receptor, or, qualitatively, receptors upwind of source with respect to prevailing wind Where mitigation relies on dispersion/dilution - releases are from high level (e.g. stacks, or roof vents greater than 3m above ridge height) and are not compromised by surrounding buildings

3.3.5 The sensitivity of the receiving receptor is defined based on the criteria shown in Table 3.

Table 3 Odour Receptor Sensitivity

Sensitivity	Description
High	Surrounding land where: • Users can reasonably expect enjoyment of a high level of amenity; and, • People would reasonably be expected to be present here continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land Examples may include residential dwellings, hospitals, schools/education and tourist/cultural
Medium	Surrounding land where: • Users would expect to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level of amenity as in their home; or, • People would not reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land Examples may include places of work, commercial/retail premises and playing/recreation fields
Low	Surrounding land where: • The enjoyment of amenity would not reasonably be expected; or, • There is transient exposure, where the people would reasonably be expected to present only for limited periods of time as part of the normal pattern of use of the land Examples may include industrial use, farms, footpaths and roads

3.3.6 The estimates of Source Odour Potential and Pathway Effectiveness are considered together to predict the risk of odour exposure (impact) at the receptor location, as shown by the matrix in Table 4.

Table 4 Risk of Odour Exposure

Pathway Effectiveness	Source Odour Potential		
	Small	Medium	Large
Highly effective	Low	Medium	High
Moderately effective	Negligible	Low	Medium
Ineffective	Negligible	Negligible	Low

3.3.7 The final step is to determine the significance of odour effect at the specified receptor location through the interaction between sensitivity and risk, as outlined in Table 5.

Table 5 Significance of Odour Effect

Risk of Odour Exposure	Receptor Sensitivity		
	Low	Medium	High
High	Slight	Moderate	Substantial
Medium	Negligible	Slight	Moderate
Low	Negligible	Negligible	Slight
Negligible	Negligible	Negligible	Negligible

- 3.3.8 The IAQM guidance¹¹ states that an assessment must reach a conclusion on the likely significance of the predicted impact. Where the overall effect is **moderate** or **substantial**, the effect is likely to be considered **significant**, whilst if the effect is **slight** or **negligible**, the impact is likely to be considered **not significant**. It should be noted that this is a binary judgement of either it is **significant** or it is **not significant**. This has been considered to determine the overall significance of potential odour effects associated with the development.
- 3.3.9 The IAQM guidance recognises that assessment of odour requires some degree of professional judgement¹². Qualitative methodologies such as those utilised within this report provide guidance for assessing potential impacts. However, professional judgement should be exercised in order to take account of the specific details which are unique to each development. This has been considered as necessary throughout the assessment. The IAQM also suggest that the assessor's qualifications and experience are detailed within an Odour Assessment. These are provided in Appendix 1.

¹¹ Guidance on the Assessment of Odour for Planning v1.1, IAQM, 2018.

¹² Guidance on the Assessment of Odour for Planning v1.1, IAQM, 2018.

4.0 **BASELINE**

4.1 **Introduction**

- 4.1.1 Existing conditions in the vicinity of the site were identified in order to provide a baseline for the assessment. These are detailed in the following Sections.

4.2 **Site Description**

- 4.2.1 The proposed development is located within a suburban setting. The site is bordered to the north by the A643 with the M62 beyond to the east by a commercial unit and to the west and south by residential properties.

4.3 **Sensitive Receptors**

- 4.3.1 A desk-top study was undertaken in order to identify any sensitive locations in the vicinity of the site that required specific consideration during the assessment. The identified receptors and associated sensitivity are summarised in Table 6.
- 4.3.2 It should be noted that the distances specified in Table 6 were measured from the closest point of the development boundary in order to provide a worst-case assessment of the separation between potential sources and sensitive receptor locations.

Table 6 Sensitive Receptor Locations

Receptor		Sensitivity	Distance from Boundary (m)	NGR (m)	
				X	Y
R1	Residential - Kew Hill	High	255	410827	419369
R2	Residential - Weatherhill Road	High	30	410965	419190
R3	Residential - Warren House Lane	High	90	411113	419142
R4	Residential - Ainley Road	High	20	411127	419037
R5	Residential - Alderston Rise	High	Adjacent	411120	418997
R6	Residential - Alderston Rise	High	Adjacent	411043	418961

Receptor		Sensitivity	Distance from Boundary (m)	NGR (m)	
				X	Y
R7	Residential - Warton Avenue	High	155	410978	418771
R8	Residential - Haigh Road	High	20	410869	418867
R9	Commercial - Mac's Truck Sales	Medium	70	410691	418852
R10	Residential - Lindley Moor Road	High	50	410682	418995

4.3.3 As shown in Table 6, the closest sensitive receptors to the site are R5 and R6 which are residential dwellings on Alderston Drive which is adjacent to the southern site boundary.

4.3.4 Reference should be made to Figure 2 for a map of the receptors.

4.4 Meteorological Conditions

4.4.1 The potential for atmospheric emissions to impact at sensitive locations depends significantly on the meteorology, particularly wind direction, during release. In order to consider prevailing conditions at the site, review of historical weather data was undertaken. Meteorological data used in the assessment was obtained from Bingley meteorological station is located at NGR: 408874, 435015, which is approximately 16.0km north of the development. It is considered that conditions are likely to be reasonably similar over a distance of this magnitude and the information is a suitable source of data for an assessment of this nature.

4.4.2 Meteorological data was obtained from Bingley Meteorological Station over the period 1st January 2015 to 31st December 2019 (inclusive). This is summarised in Table 7. The sector with the highest frequency of winds is shown in **bold**. Reference should be made to Figure 3 for a wind rose of the meteorological data.

Table 7 Wind Frequency Data

Wind Direction (°)	Frequency of Wind (%)
345 - 15	2.29
15 - 45	4.07
45 - 75	5.23
75 - 105	5.36
105 - 135	7.26
135 - 165	4.97
165 - 195	5.26
195 - 225	15.66
225 - 255	14.44
255 - 285	21.11
285 - 315	9.41
315 - 345	3.19
Sub-Total	98.24
Calms	0.98
Missing/Incomplete	0.78

4.4.3 As shown in Table 7, the prevailing wind direction at the site is from the west. Winds from the north and east are relatively infrequent, which is indicative of conditions throughout the majority of the UK.

4.4.4 All meteorological data used in the assessment was provided by Atmospheric Dispersion Modelling Ltd, which is an established distributor of meteorological data within the UK.

5.0 ASSESSMENT

5.1 Risk Assessment

5.1.1 The development has the potential to cause odour impacts as a result of emissions from the proposed restaurant during normal operation. The risk associated with the scheme was therefore assessed at the identified receptor locations in accordance with the IAQM methodology¹³.

5.1.2 The first step was to classify the Source Odour Potential. This is summarised in Table 8.

Table 8 Source Odour Potential

Source	Source Odour Potential	Justification
Proposed Restaurant - Unit C (Use Class A3)	Small	Magnitude - Activities at the proposed restaurant will not be controlled under the Environmental Permitting (England and Wales) Regulations (2016) and subsequent amendments Unpleasantness - Odours associated with food processing activities are considered to be 'less offensive' or 'moderately offensive' in accordance with EA Guidance H4¹⁴ Mitigation/ Control - A specific mitigation strategy has not yet been developed for the proposed restaurant as the planning application is in outline format and the end user, menu and cooking methods have not been confirmed. However, the applicant has confirmed that following finalisation of the design, an odour control strategy will be developed in accordance with the DEFRA document 'Guidance on the Control of Odour and Noise from Kitchen Exhaust Systems'¹⁵. The requirement for this could be secured through planning condition, if required Summary - A small source odour potential has been assigned based on the stated factors and subject to the inclusion of appropriate mitigation

¹³ Guidance on the Assessment of Odour for Planning v1.1, IAQM, 2018.

¹⁴ H4: Odour Management, EA, 2011.

¹⁵ Control of Odour and Noise from Commercial Kitchen Exhaust Systems, EMAQ+, 2018.

5.1.3 The Pathway Effectiveness was subsequently defined between the sources and the development based on the distance from the boundary and the prevailing wind direction in relation to the site. This is summarised in Table 9.

Table 9 Odour Pathway Effectiveness

Receptor		Pathway Effectiveness	Justification
R1	Residential - Kew Hill	Ineffective	Receptor is distanced from the source, approximately 255m north of the site boundary There is a low frequency of winds from sources to receptor (3.19%) Trees are located to the north of the site boundary. These are likely to provide screening of odours during leafed periods and generate turbulent flow locally and throughout the year, which will help promote the effective dilution and dispersion of any emissions associated with the premises
R2	Residential - Weatherhill Road	Moderately effective	Receptor is local to the source, approximately 30m north-east of the site boundary There is a low frequency of winds from sources to receptor (4.07%)
R3	Residential - Warren House Lane	Moderately effective	Receptor is located approximately 90m north-east of the site boundary There is a low frequency of winds from sources to receptor (5.23%)
R4	Residential - Ainley Road	Moderately effective	Receptor is located approximately 20m south of the site boundary There is a low frequency of winds from sources to receptor (5.36%)
R5	Residential - Alderston Rise	Moderately effective	Receptor is adjacent to the southern site boundary There is a low frequency of winds from source to receptor (5.36%)
R6	Residential - Alderston Rise	Moderately effective	Receptor is adjacent to the southern site boundary There is a low frequency of winds from sources to receptor (7.26%)
R7	Residential - Warton Avenue	Ineffective	Receptor is located approximately 155m from the site boundary

Receptor		Pathway Effectiveness	Justification
			There is a low frequency of winds from sources to receptor (4.97%) Trees are located to the south of the site boundary. These are likely to provide screening of odours during leafed periods and generate turbulent flow locally and throughout the year, which will help promote the effective dilution and dispersion of any emissions associated with the premises
R8	Residential - Haigh Road	Moderately effective	Receptor is located approximately 20m south of the site boundary There is a low frequency of winds from sources to receptor (5.36%)
R9	Commercial - Mac's Truck Sales	Moderately effective	Receptor is located approximately 70m west of the site boundary There is a moderate frequency of winds from sources to receptor (14.44%)
R10	Residential - Lindley Moor Road	Highly effective	Receptor is located approximately 50m north-west of the site boundary There is a high frequency of winds from sources to receptor (21.11%)

5.1.4 The above information has been used to assess odour risk from the identified source. This is summarised in Table 10. It is worth noting that a **small** source odour potential has been assigned to the restaurant.

Table 10 Odour Risk Assessment

Receptor		Source Odour Potential	Pathway Effectiveness	Exposure Risk	Sensitivity	Effect Significance
R1	Residential - Kew Hill	Small	Ineffective	Negligible	High	Negligible
R2	Residential - Weatherhill Road	Small	Moderately effective	Negligible	High	Negligible
R3	Residential - Warren House Lane	Small	Moderately effective	Negligible	High	Negligible
R4	Residential - Ainley Road	Small	Moderately effective	Negligible	High	Negligible
R5	Residential - Alderston Rise	Small	Moderately effective	Negligible	High	Negligible

Receptor		Source Odour Potential	Pathway Effectiveness	Exposure Risk	Sensitivity	Effect Significance
R6	Residential - Alderston Rise	Small	Moderately effective	Negligible	High	Negligible
R7	Residential - Warton Avenue	Small	Ineffective	Negligible	High	Negligible
R8	Residential - Haigh Road	Small	Moderately effective	Negligible	High	Negligible
R9	Commercial - Mac's Truck Sales	Small	Moderately effective	Negligible	Medium	Negligible
R10	Residential - Lindley Moor Road	Small	Highly effective	Low	High	Slight

5.1.5 As shown in Table 10, the predicted odour effect significance was **negligible** at nine receptor locations and **slight** at one position. The IAQM guidance states that only if the impact is **moderate** or **substantial**, the effect is considered **significant**. As such, impacts are considered to be **not significant** in accordance with the stated methodology.

5.1.6 A specific mitigation strategy has not yet been developed for the proposed restaurant as the planning application is in outline format and the end user, menu and cooking methods have not been confirmed. However, the applicant has verified that following finalisation of the design, an odour control strategy will be developed in accordance with the DEFRA document 'Guidance on the Control of Odour and Noise from Kitchen Exhaust Systems'. The requirement for this could be secured through planning condition, if required.

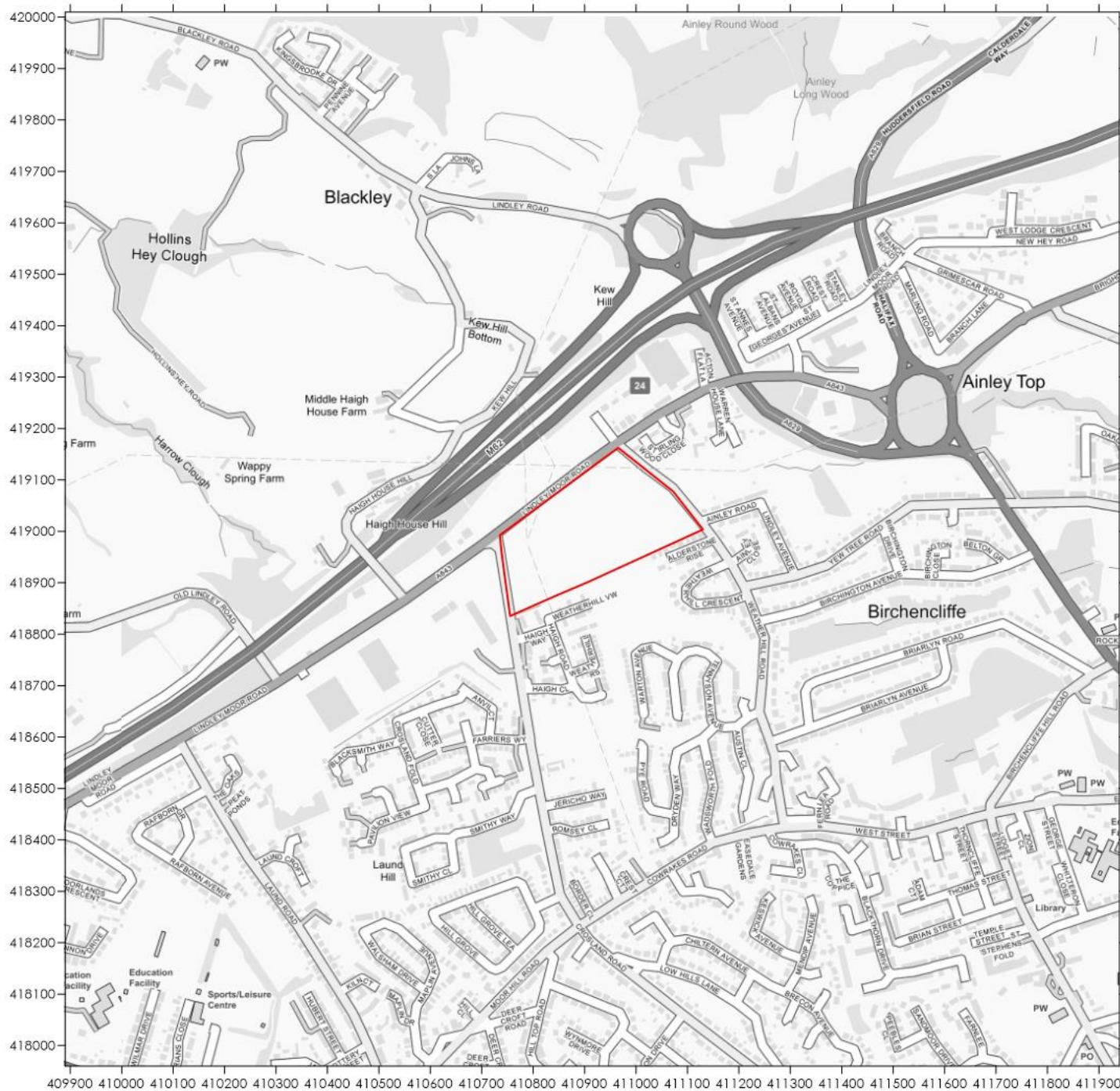
6.0 CONCLUSION

- 6.1.1 Redmore Environmental Ltd was commissioned by 2SH Developments to provide an Odour Assessment in support in support of a mixed-use development on land off Lindley Moor Road, Lindley.
- 6.1.2 The proposals include provision of a restaurant. Concerns have been raised that odour emissions from this premises may have the potential affect amenity levels at sensitive locations in the vicinity of the site. An Odour Assessment was therefore undertaken in order to consider effects associated with the scheme.
- 6.1.3 The risk of potential odour effects at sensitive locations was assessed using the IAQM methodology. This included consideration of the Source Odour Potential, Pathway Effectiveness and receptor sensitivity. The results of the assessment indicated the predicted odour effect significance was **negligible** at nine receptor locations and **slight** at one position. The IAQM guidance states that only if the impact is greater than **slight**, the effect is considered significant. As such, impacts are considered **not significant**, in accordance with the stated methodology.
- 6.1.4 Following consideration of the relevant issues, impacts as a result of emissions from the proposed restaurant were considered to be **not significant**, in accordance with the IAQM guidance. As such, it is considered that odour should not be viewed as a constraint to planning consent for the development.

7.0 **ABBREVIATIONS**

DEFRA	Department of Environment and Rural Affairs
EA	Environment Agency
IAQM	Institute of Air Quality Management
KC	Kirklees Council
NGR	National Grid Reference
NPPF	National Planning Policy Framework
ODT	Odour Detection Threshold

Figures



Legend



Site Boundary

Title

Figure 1 - Site Location Plan

Project

Odour Assessment
Lindley Moor Road, Lindley

Project Reference

3552-3

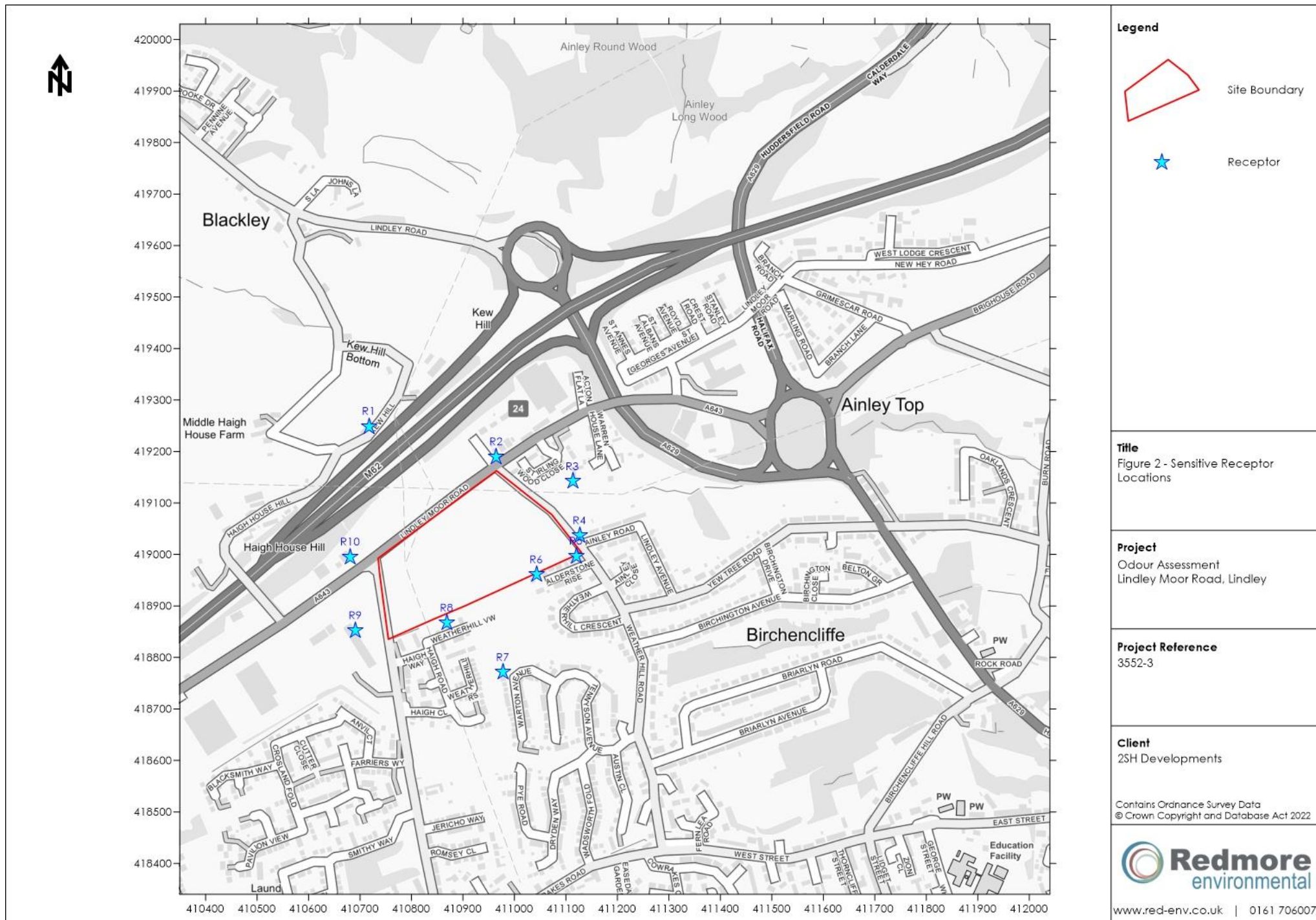
Client

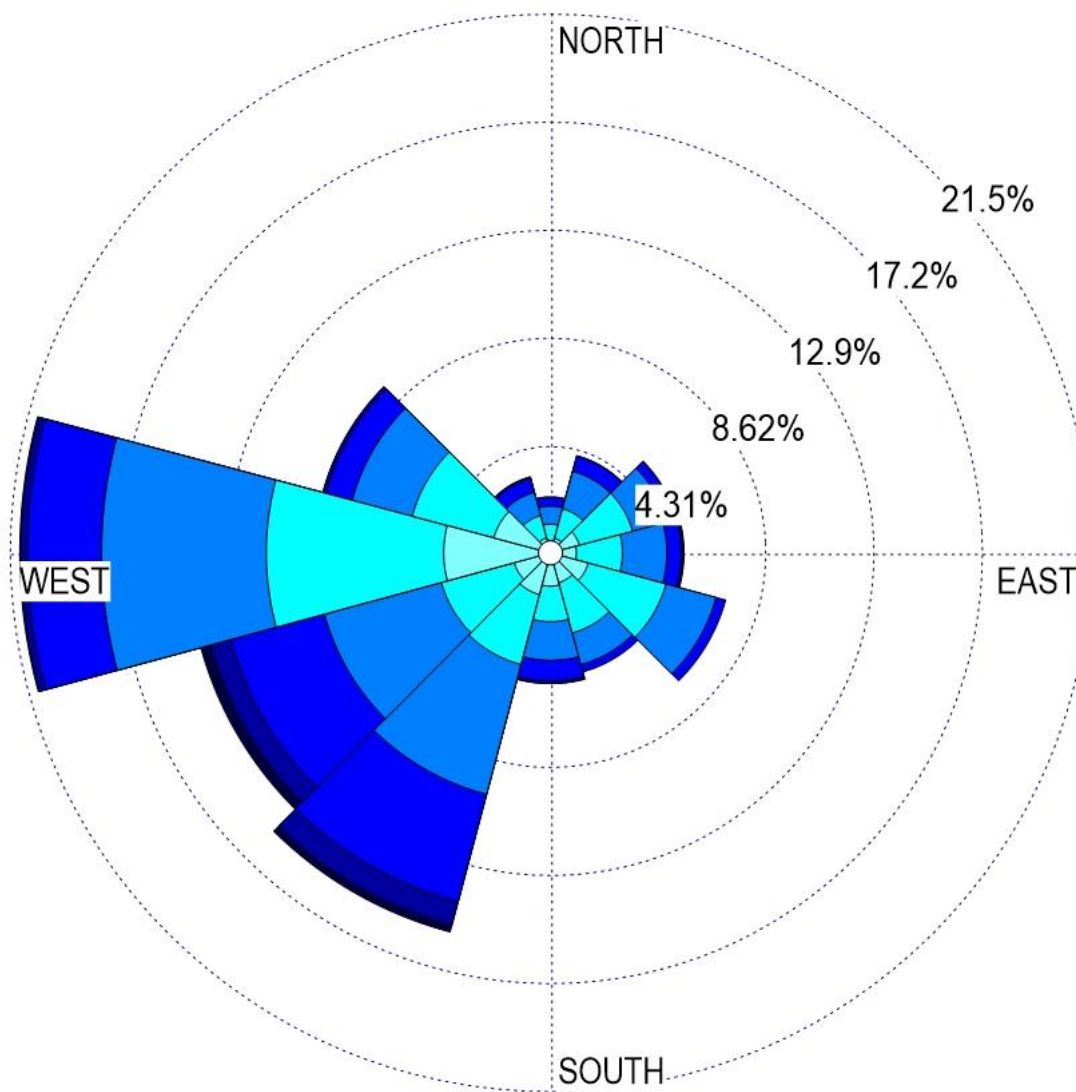
2SH Developments

Contains Ordnance Survey Data
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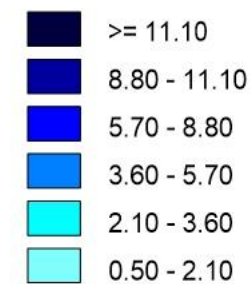
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Legend

WIND SPEED
(m/s)



Calms: 0.98%

Title

Figure 3 - Wind Rose of 2015 to 2019
Bingley Meteorological Data

Project

Odour Assessment
Lindley Moor Road, Lindley

Project Reference

3352-3

Client

2SH Developments



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Appendix 1 - Curricula Vitae

KEY EXPERIENCE:

Ger is an Associate Director with specialist experience in the odour and air quality sectors. His key capabilities include:

- Production of Air Quality, Dust and Odour Assessments in accordance with Department for Environment, Food and Rural Affairs (DEFRA) and Institute of Air Quality Management (IAQM) methodologies for a range of residential, commercial and industrial sectors.
- Detailed dispersion modelling of industrial sources using ADMS-5 to determine impacts of emissions on local air quality and amenity as a consequence of odour.
- Odour sampling and analysis as part of performance testing for odour abatement plant and mitigation appraisal.
- Odour and dust surveys to assess amenity and suitability of sites for residential development.
- Odour and dust risk assessments to determine odour effect significance in accordance with IAQM Guidance.
- Modelling of road vehicle exhaust emissions using ADMS-Roads. Studies have included assessment of road traffic exhaust emissions on sensitive receptors and exposure of new residents to poor air quality.
- Design and project management of pollutant monitoring campaigns.
- Co-ordination and management of large-scale multi-disciplinary projects and submissions.

SELECT PROJECTS SUMMARY:

Industrial

GP Plantscape, Blantyre - Odour Assessment in relation to existing operations at the In-Vessel Composting (IVC) facility operated by the company.

Moir Seafoods, Morpeth - Odour Management Plan prepared to control impacts associated with emissions from the facility operated by the company.

Bioganix, Bonby - Odour Assessment in support of an Environmental Permit Variation for the food waste processing facility operated by the company.

Alne Material Recycling, York - Odour Emissions Monitoring and Odour Assessment undertaken in support of compliance with the Environmental Permit for the facility.

Dryholme Anaerobic Digestion (AD) Plant - Odour Assessment in support of an Environmental Permit Variation for the facility.

Pets Choice, Blackburn - Odour Assessment in support of an Environmental Permit Application for the manufacturing facility operated by the company.

Crofthead Biogas AD Plant - Odour Assessment in support of an Environmental Permit Application for the facility.

Cofresh Snack Foods - Odour Assessment to investigate potential impacts associated with emissions from the manufacturing facility operated by the company.

Tulip Fresh Meats, Ashton-Under-Lyne - Odour consultancy services in support of an Environmental Permit Variation Application for the facility.

Five Ways Road, Warwick - Odour Assessment in support of a planning application for an extension to an existing poultry abattoir.

Residential

Broadnook Garden Suburb, Birstall - Odour Assessment in support of a residential development which involved completion of Field Odour Surveys and a Risk Assessment in accordance with IAQM guidance.

Hungerford House Farm, Madeley - Odour Assessment in support of the conversion of an existing agricultural building to a residential dwelling.

Hales Pasture Farm, Allostock - Odour consultancy services in support of a nuisance claim by the owner of the property.

North Leigh Park, Wigan - Odour Assessment in support of a planning application for residential development.

New Road, Tintwistle - Odour Assessment to evaluate potential impacts at a proposed residential development as a result of emissions from an existing Wastewater Treatment Works (WwTWs).

Land at Mobberley - Odour Assessment to evaluate potential impacts at a proposed residential development as a result of emissions from an existing WwTWs.

Island Carr Road, Brigg - Odour Assessment to evaluate potential impacts at a proposed residential development as a result of emissions from an existing WwTWs.

Moorland Grange Farm, Bingley - Odour Assessment in support of the conversion of an existing agricultural building to a residential dwelling.

Irwell Vale Mill, Ramsbottom - Odour Assessment to evaluate potential impacts at a proposed residential development as a result of emissions from an existing WwTWs.

KEY EXPERIENCE:

Emily is an Associate Director with specialist experience in the air quality sector. Her key capabilities include:

- Production of Air Quality Assessments in accordance with Department for Environment, Food and Rural Affairs (DEFRA) methodologies for a range of residential, commercial and industrial sectors.
- Detailed dispersion modelling of road vehicle and industrial emissions using ADMS-Roads and ADMS-5. Studies have included impact assessment of ground level pollutant and odour concentrations and assessment of suitability of development sites for proposed end-use.
- Project management and co-ordination of Environmental Impact Assessments and scoping reports for developments throughout the UK.
- Assessment of fugitive dust impacts from a range of mineral extraction developments.
- Assessment of petrol stations to address benzene concentrations and their impact on adjacent developments.
- Production of air quality mitigation strategies specifically tailored to address issues at individual sites.
- Assessment of potential effects associated with network realignment schemes and highway developments.

SELECT PROJECTS SUMMARY:

Broad Street, Birmingham

Air Quality Assessment in support of a residential-led development on land at Broad Street, Birmingham. The proposals were located adjacent to a section of the Midland Metro Westside which runs along Broad Street. Consideration was made to the potential for re-alignment of the local road network as a result of the Metro to effect pollution levels at the development. The assessment indicated NO₂ concentrations exceeded air quality criteria from ground to third floor level as a result of road vehicle exhaust emissions. Mitigation was therefore specified for the affected units.

Home Farm, Forest Road, Warfield

Ecological Air Quality Assessment in support of a residential development. Natural England held concerns regarding potential impacts at sensitive ecological designations as a result of traffic exhaust emissions associated with the development. The predicted change in NO_x and ammonia concentrations and nitrogen and acid deposition was below the relevant criteria at all locations within the ecological designations. Impacts were therefore not considered to be significant.

Saltcoats Road, Stevenston

Air Quality Assessment in support of an educational campus and associated energy centre. Impacts associated with emissions from the proposed gas and biomass boilers were assessed through detailed dispersion modelling. This indicated impacts on annual mean NO₂ and PM₁₀ concentrations were predicted to be not significant.

Blackthorn & Piddington

Environmental Impact Assessment in support of a railway embankment scheme on land at the Network Railway Embankment between Piddington and Blackthorn. Due to the extensive stabilisation works a Fugitive Dust Emissions Assessment was undertaken in addition to consideration of road vehicle exhaust emissions. Due to the location of the site in relation to nearby sensitive receptors, potential impacts associated with construction works were not considered to be significant.

Blackmoorfoot Road, Huddersfield

Air Quality in support of a residential-led development in close proximity to an operational minerals facility. Due to the presence of the Johnsons Wellfield Quarry to the south of the site a Fugitive Dust Emissions Assessment was undertaken to determine potential impacts. Dispersion modelling of road vehicle exhaust emissions was also undertaken in support of the scheme. Results indicated the overall significance of fugitive dust emissions from the quarry and air quality impacts associated with operation of the development itself were not significant.

Lockwood Bar, Huddersfield

Air Quality Assessment for the proposed highway realignment scheme along Lockwood Road, Huddersfield. Changes in pollution levels were considered at sensitive receptors as a result of variations to road geometry and associated redistribution of vehicle trips across the local area. Results of the dispersion modelling study indicated air quality impacts as a result of the scheme were not significant.