



Azymuth Acoustics UK

Professional Acoustic Services

Odour Assessment

Ref: AA0239

Every Street

Land off Every Street

Bury

BL9 5BE

On behalf of

**BGI – Housing Development,
Bury Council**



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1.0 INTRODUCTION

1.1 Background

1.1.1 Azymuth Acoustics UK was commissioned by BGI – Housing Development to undertake an Odour Assessment in support of the redevelopment of an existing residential site on land off Every Street, Bury.

1.1.2 The site is located to the east of the SUEZ Recycling and Recovery UK waste management facility. Odour emissions associated with operations at the plant may have the potential to affect amenity levels at the development. An Odour Assessment has therefore been undertaken in order to determine baseline conditions at the site and consider the potential for impacts.

1.2 Site Location and Context

1.2.1 The proposed development is located on land off Every Street, Bury, BL9 5BE, at approximate National Grid Reference (NGR): 380560, 411708. Reference should be made to Figure 1 for a map of the site and surrounding area.

1.2.2 The site is currently operational as an existing traveller site with 17 plots. The proposals comprise redevelopment of the land to provide 12 plots as well as associated parking and site facilities.

1.2.3 The site is located to the east of the SUEZ Recycling and Recovery UK waste management facility. This has the potential to form a source of odour emissions during normal operation and result in reduced amenity for future residents of the development. A two stage Odour Assessment was therefore undertaken to investigate potential odour impacts at the site. This included three Field Odour Surveys and a Risk Assessment. The findings are detailed in the following report.

2.0 ODOUR BACKGROUND

2.1 Odour Definition

2.1.1 The Institute of Air Quality Management (IAQM) guidance¹ 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) guidance²) is a useful reminder of the factors that will determine the degree of odour pollution. These are described by the IAQM³ as follows:

- **Frequency** - how often an individual is exposed to odour;
- **Intensity** - the individual's perception of the strength of the odour;
- **Duration** - The overall duration that individuals are exposed to an odour over time;
- **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,
- **Location** - 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.

2.2.2 It is important to note that even infrequent emissions may cause a loss of enjoyment of outdoor spaces associated with residential development.

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

² H4: Odour Management, EA, 2011.

³ Guidance on the Assessment of Odour for Planning v1.1, IAQM, 2018.

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 to those 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 industrial activities, including food and drink manufacturing, is the Environmental Permitting (England and Wales) Regulations (2016) and subsequent amendments. If a process is deemed potentially odorous then the relevant regulator will usually include an appropriate condition in the site's Environmental Permit to restrict impacts beyond the facility boundary.

2.3.2 Enforcement of the condition is by the relevant regulator, either the EA for Part A(1) processes, or the Local Authority for Part (A2) and B processes. If the regulator is satisfied that odour from a facility is causing pollution beyond the site boundary, then they can serve an improvement notice that requires remedial works to be undertaken to reduce impacts to an acceptable level. The measures that are deemed appropriate will depend on the industry sector and site-specific circumstances and will take costs and benefits into account. Should appropriate actions not be taken by the operator then the regulator has a number of available options, cumulating in the revocation of the Environmental Permit and cessation of all activities on site.

2.3.3 The main requirement with respect to odour control from premises not controlled under the Environmental Permitting (England and Wales) Regulations (2016) and subsequent

amendments, 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."

2.3.4 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.

2.3.5 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 Framework⁴ (NPPF) was published in July 2021 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."

⁴ NPPF, Ministry of Housing, Communities and Local Government, 2021.

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 users⁴⁹; and where crime and disorder, and the fear of crime, do not undermine the quality of life or community cohesion and resilience."

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

2.5 Local Planning Policy

2.5.1 The Bury Unitary Development Plan⁵ (UDP) was adopted by Bury Council (BC) on 29th August 1997 and acts as a guide for development in the borough. A review of the Bury UDP was undertaken in order to identify any planning policies relevant to the assessment. This indicated the following:

"EN7 - Pollution Control

The Council will seek to control environmental nuisance and minimise pollution levels associated with development by limiting the environmental impact of pollution, wherever possible, in conformity with current legislation and prescribed standards."

"EN7/1 - Atmospheric Pollution

In seeking to limit atmospheric pollution the Council will not permit development which:

⁵ Bury UDP, BC, 1997.

- Would result in unacceptable levels of atmospheric pollution; and/or
- Is not compatible with the achievement of the Council's long term air quality standards."

2.5.2 The implications of the stated policies have been considered throughout this assessment.

2.6 Institute of Air Quality Management Guidance

2.6.1 The IAQM published the 'Guidance on the Assessment of Odour for Planning'⁶ document on 20th May 2014. This was updated in 2018⁷ and specifically deals with assessing odour impacts for planning purposes, namely potential effects on amenity.

⁶ Guidance on the Assessment of Odour for Planning, IAQM, 2014.

⁷ Guidance on the Assessment of Odour for Planning v1.1, IAQM, 2018.

3.0 **BASELINE**

3.1 **Introduction**

3.1.1 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.

3.2 **Site Description**

3.2.1 The proposed development is located approximately 700m north of Bury town centre on land off Every Street. The site is bordered to the east, south and west by industrial units and to the north by an educational facility with residential properties beyond.

3.3 **Potential Odour Sources**

Desk Top Study

3.3.1 A study was undertaken in order to identify potential odour sources in the vicinity of the site that required specific consideration during the assessment. It should be noted that this focused on the SUEZ Recycling and Recovery UK facility, located to the west of the proposals, due to concerns that odour emissions may have the potential to affect amenity levels at the development.

3.3.2 The identified sources are summarised in Table 1.

Table 1 Potential Emission Source Locations

Source		Distance from Site (m)	Direction from Site	Description of Activities	Potential Emissions
1	SUEZ Recycling and Recovery UK	15	West	Household waste processing and recycling	Waste type odours

3.3.3 Reference should be made to Figure 2 for a map showing the potential odour sources in relation to the proposed development.

3.4 Meteorological Conditions

- 3.4.1 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. The closest observation station to the development is Manchester Airport meteorological station at NGR: 381792, 384116, which is approximately 27.6km south of the site boundary. 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.
- 3.4.2 Meteorological data was obtained from Manchester Airport meteorological station over the period 1st January 2015 to 31st December 2019 (inclusive). This is summarised in Table 2. Reference should be made to Figure 3 for a wind rose of the meteorological data. The sector with the highest frequency of winds is shown in **bold**.

Table 2 Wind Frequency Data

Wind Direction (°)	Frequency of Wind (%)
345 - 15	1.74
15 - 45	3.52
45 - 75	5.94
75 - 105	6.11
105 - 135	5.15
135 - 165	8.08
165 - 195	17.99
195 - 225	14.07
225 - 255	9.65
255 - 285	11.31
285 - 315	9.56
315 - 345	3.55
Sub-Total	96.66

Calms	1.93
Wind Direction (°)	Frequency of Wind (%)
Missing/Incomplete	1.41

3.4.3 As shown in Table 2, the prevailing wind direction at the site is from the south. Winds from the north are relatively infrequent, which is indicative of conditions throughout the majority of the UK.

3.4.4 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.

4.0 METHODOLOGY

4.1 Introduction

- 4.1.1 The development has the potential to expose future residents to any existing odour issues at the site. An Odour Assessment has therefore been undertaken in accordance with the IAQM 'Guidance on the Assessment of Odour for Planning'⁸ document, as summarised in the following Sections.

4.2 Field Odour Surveys

Background

- 4.2.1 An adverse effect of odour exposure, such as annoyance or loss of amenity, is subjective and is not something that can be wholly defined or assessed by scientific methods alone. An assessment can therefore be strengthened by including a subjective assessment of prevailing odour conditions by those directly affected or by experienced, trained, observers.
- 4.2.2 Sensory testing techniques use the human nose as the analytical sensor to enable the odour magnitude (as either intensity or concentration), frequency, duration and offensiveness of the odour to be recorded at a particular location at a specific time. This is a sound approach considering that no analytical instrument can currently give a unified measure of a complex mixture of compounds that quantifies it as a whole in the same way that a human experiences odour. Sensory testing also allows the character of the odour to be assessed, which is a great benefit when there are a number of different odour sources.
- 4.2.3 Subjective sensory tests, such as the Field Odour Survey, should not automatically be considered inferior to quantitative ambient monitoring. When carried out to a rigorous, well-designed methodology, the results of such sensory surveys can be expected to be robust and reproducible.

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

Field Odour Survey Procedure

4.2.4 Sensory tests were carried out at a number of survey locations on 18th August 2021, 19th August 2021 and 6th September 2021. The survey positions were chosen to provide an indication of existing conditions throughout the development site and downwind of the identified source.

4.2.5 The survey locations are summarised in Table 3 and shown visually on Figure 4.

Table 3 Survey Locations

Position	Location Description
1	Proposed development - North-western section
2	Proposed development - South-western section
3	Proposed development - Northern central section
4	Proposed development - Southern central section
5	Proposed development - North-eastern section
6	Proposed development - South-eastern section

4.2.6 Monitoring was undertaken over a 5-minute period at each position. For each test location, the start time of the observation period, meteorological conditions and the attributes of the odour were recorded as follows:

- The assessor breathed normally, inhaling ambient air samples through the nose every 10-seconds, to give 30 samples over the 5-minute observation period; and, • For each sample, the odour intensity was recorded using the scale outlined in Table 4.

Table 4 Odour Intensity Scale

Odour Strength	Intensity Level	Comments
No odour/not perceptible	0	No odour when compared to the clean site
Slight/very weak	1	There is probably some doubt as to whether the odour is actually present

Odour Strength	Intensity Level	Comments
Slight/weak	2	The odour is present but cannot be described using precise words or terms
Distinct	3	The odour character is barely recognisable
Strong	4	The odour character is easily recognisable
Very strong	5	The odour is offensive. Exposure to this level would be considered undesirable
Extremely strong	6	The odour is offensive. An instinctive reaction would be to mitigate against further exposure

- At the end of the observation period at the test location, the odour unpleasantness was noted by classifying it as unpleasant, neutral (neither pleasant nor unpleasant) or pleasant. This assumed that at least some of the 30 samples were of intensity 3 or more (i.e. the odour is at least 'barely recognisable');
- The odour descriptor and meteorological conditions were also noted;
- The pervasiveness/extent of the odour at the test location was assessed by calculating the percentage odour time, $t_{\geq 4}$, which is the number of samples where odour was recognisable divided by the total number of samples (i.e. 30). Note that 'recognisable odour' is where the odour strength exceeds the recognition threshold and is definitely recognisable by the assessor i.e. the assessor is capable of definitely identifying its quality/character, which corresponds to an intensity of 4 or more; and,
- The average odour intensity (I_{mean}) over the test period was calculated and the maximum intensity (I_{max}) noted.

4.2.7 The following additional factors were also adopted to safeguard the quality of the sensory assessments:

- The odour assessor would not have undertaken the assessment if they had a cold, sore throat, sinus trouble, etc;
- The odour assessor was not hungry or thirsty;
- The odour assessor did not work within half an hour of the end of their last meal;

- The odour assessor did not smoke or consume strongly flavoured food or drink, including coffee, for at least half an hour before the field odour survey was carried out, or during the survey;
- The odour assessor did not consume confectionery or soft drinks for at least half an hour before the field odour survey was carried out, or during the survey;
- Scented toiletries, such as perfume/aftershave were not used on the day of the field odour survey; and,
- The vehicle used during the field odour survey did not contain any deodorisers.

Odour Exposure

4.2.8 Following completion of the Field Odour Surveys, the matrix outlined in Table 5 was utilised to determine the level of odour exposure at each monitoring location.

Table 5 Odour Exposure

Average Intensity (I_{mean})	Percentage Odour Time ($t_{\geq 4}$)				
	$\leq 10\%$	11% to 20%	21% to 30%	31% to 40%	$\geq 41\%$
6	Large	Very Large	Very Large	Very Large	Very Large
5	Medium	Large	Large	Very Large	Very Large
4	Small	Medium	Medium	Large	Large
3	Small	Medium	Medium	Medium	Medium
2	Small	Small	Medium	Medium	Medium
1	Small	Small	Small	N/A	N/A

4.2.9 It should be noted that I_{mean} was rounded to the nearest whole number.

4.2.10 The following overriding considerations also affect the scoring of the odour annoyance impact:

- If $I_{\text{mean}} = 0$, then the odour effect can for practical purposes be considered **negligible**; and,
- If $I_{\text{mean}} = 1$ but $t_{\geq 4} = 0\%$, then the odour effect can for practical purposes be considered **negligible**.

Significance of Odour Effect

4.2.11 Following the determination of the odour exposure level, the significance of effect was determined through the interaction with receptor sensitivity, as outlined in Table 6.

Table 6 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

4.2.12 The assessment matrix is provided in Table 7.

Table 7 Odour Effect Significance

Overall Odour Exposure	Receptor Sensitivity		
	Low	Medium	High
Very Large	Substantial	Substantial	Substantial

Large	Moderate	Moderate	Substantial
Medium	Slight	Slight	Moderate
Small	Negligible	Negligible	Slight

4.3 **Risk Assessment**

Background

4.3.1 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.

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

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

4.3.3 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.

4.3.4 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;
- 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.

4.3.5 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.

Risk Assessment Procedure

4.3.6 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.

4.3.7 Using the example risk ranking in Table 8, the Source Odour Potential can be categorised as **small, medium or large**.

Table 8 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 H4⁹; 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

4.3.8 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

⁹ H4: Odour Management, EA, 2011.

wind speed, which gives poor dispersion and dilution. Receptors close to the source 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.

4.3.9 Using the example risk ranking in Table 9, the pollutant pathway from source to receptor can be categorised as **ineffective**, **moderately effective** or **highly effective**.

Table 9 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

4.3.10 The sensitivity of the receiving receptor is defined based on the criteria shown in Table 6.

4.3.11 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 10.

Table 10 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

4.3.12 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 11.

Table 11 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

4.4 Overall Odour Significance

4.4.1 The IAQM guidance¹⁰ states that an assessment must reach a conclusion on the likely significance of the predicted impact. Where the overall effect is **moderate** or **substantial**,

¹⁰ Guidance on the Assessment of Odour for Planning v1.1, IAQM, 2018.

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 facility.

- 4.4.2 The IAQM guidance recognises that assessment of odour requires some degree of professional judgement¹¹. 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.

5.0 **RESULTS**

5.1 **Field Odour Surveys**

Field Odour Survey 1

5.1.1 Field Odour Survey 1 was undertaken between 09:56 and 10:47 on 18th August 2021. The results are summarised in Table 12.

Table 12 Field Odour Survey 1 - Results

Position	$f_{t \geq 4}$ (%)	I_{mean}	I_{max}	Unpleasantness	Odour Description	Notes
1	0	2	2	N/A	Refuse	-
2	0	2	3	Unpleasant	Dog faeces	Dog kennels adjacent to monitoring location
3	0	2	3	Unpleasant	Refuse, sulphide	-
4	0	2	3	Unpleasant	Refuse	-
5	0	1	2	N/A	Refuse	-
6	0	2	2	N/A	Refuse	-

5.1.2 The meteorological conditions during the monitoring were light drizzle with temperatures of approximately 15°C. The wind direction was from the west at all monitoring locations. The wind speed was rated between 1 and 2 on the Beaufort scale.

Field Odour Survey 2

5.1.3 Field Odour Survey 2 was undertaken between 15:38 and 16:25 on 19th August 2021. The results are summarised in Table 13.

Table 13 Field Odour Survey 2 - Results

Position	$f_{\geq 4}$ (%)	I_{mean}	I_{max}	Unpleasantness	Odour Description	Notes
1	3	2	4	Unpleasant	Refuse, food waste, freshly cut grass, sulphide	-
Position	$f_{\geq 4}$ (%)	I_{mean}	I_{max}	Unpleasantness	Odour Description	Notes
2	0	2	3	Unpleasant	Refuse, dog faeces	Dog kennels adjacent to monitoring location
3	0	1	2	N/A	Refuse, food waste	-
4	0	2	3	Unpleasant	Refuse, food waste	-
5	0	1	2	N/A	Smoke, refuse	-
6	3	2	4	Unpleasant	Smoke	Ash visible within the air

- 5.1.4 The meteorological conditions during the monitoring were dry with temperatures of approximately 16°C. The wind direction was from the west-south-west at positions 1 and 2 and from the south-west at all remaining locations. The wind speed was rated between 1 and 2 on the Beaufort scale.

Field Odour Survey 3

- 5.1.5 Field Odour Survey 3 was undertaken between 15:00 and 15:37 on 6th September 2021. The results are summarised in Table 14.

Table 14 Field Odour Survey 3 - Results

Position	$f_{\geq 4}$ (%)	I_{mean}	I_{max}	Unpleasantness	Odour Description	Notes
1	0	1	3	Unpleasant	Refuse	-

2	30	3	4	Unpleasant	Refuse	-
3	10	3	4	Unpleasant	Refuse	-
4	0	2	3	Unpleasant	Refuse	-
5	20	3	4	Unpleasant	Refuse	-
6	0	1	2	Neutral	Vegetation	-

- 5.1.6 The meteorological conditions during the monitoring were dry and sunny with temperatures of approximately 24°C. The wind direction was from the west at all monitoring positions. The wind speed was rated between 1 and 2 on the Beaufort scale.

Odour Exposure and Significance

- 5.1.7 Following completion of the three Field Odour Surveys, odour exposure at each of the monitoring locations was determined. This is summarised in Table 15. Any exposure risk greater than **negligible** is shown in **bold**.

Table 15 Odour Exposure

Position	Odour Exposure		
	Field Odour Survey 1	Field Odour Survey 2	Field Odour Survey 3
1	Negligible	Small	Negligible
2	Negligible	Negligible	Medium
3	Negligible	Negligible	Small
4	Negligible	Negligible	Negligible
5	Negligible	Negligible	Medium
6	Negligible	Small	Negligible

- 5.1.8 As shown in Table 15, the risk of odour exposure was **negligible** at all locations during Survey 1, ranged from **negligible** to **small** during Survey 2 and **negligible** to **medium** during Survey 3. It should be noted that impacts relate to all odours detected, as well as those thought to be associated with the identified source.
- 5.1.9 The significance of the survey results was determined in accordance with the criteria outlined in Table 7. The proposed development includes residential land-use and is therefore considered to be of **high** sensitivity.
- 5.1.10 The significance of the odour exposure results for the Field Odour Surveys is summarised in Table 16. Any significance greater than **negligible** is shown in **bold**.

Table 16 Odour Significance

Position	Odour Significance		
	Field Odour Survey 1	Field Odour Survey 2	Field Odour Survey 3
1	Negligible	Slight	Negligible
Position	Odour Significance		
	Field Odour Survey 1	Field Odour Survey 2	Field Odour Survey 3
2	Negligible	Negligible	Moderate
3	Negligible	Negligible	Slight
4	Negligible	Negligible	Negligible
5	Negligible	Negligible	Moderate
6	Negligible	Slight	Negligible

- 5.1.11 As shown in Table 16, impacts were classified as **negligible** during Survey 1, ranged from **negligible** to **slight** during Survey 2 and **negligible** to **moderate** during Survey 3.
- 5.1.12 Reference should be made to Figure 5 for a graphical representation of the findings.

5.2 Risk Assessment

5.2.1 The odour risk at the development location was assessed in accordance with the IAQM methodology. The first step was to classify the Source Odour Potential. This is summarised in Table 17.

Table 17 Source Odour Potential

Source		Source Odour Potential	Justification
1	SUEZ Recycling and Recovery UK	Medium	- The facility is regulated as an A(1) installation by the EA in accordance with an Environmental Permit (Ref: GB3907KB/T001) - Odours from the facility would be considered "moderately offensive" in accordance with EA guidance H4¹² as the site processes household waste and activities do not involve the handling and processing of septic effluent or sludge, large proportions of decaying animal or fish remains, or operations which have the potential to give rise to biological landfill odours - Most waste processing activities take place within dedicated buildings which are likely to provide containment of emissions and limit odour release potential

5.2.2 The pathway effectiveness was subsequently defined between the source and the development based on the distance from the facility and the site boundary and the prevailing wind direction in relation to the site. This is summarised in Table 18.

Table 18 Odour Pathway Effectiveness

Source	Pathway Effectiveness	Justification
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¹² H4: Odour Management, EA, 2011.

1	SUEZ Recycling and Recovery UK	Moderately effective	- The development is located between approximately 15m and 200m from the Suez facility at the closest and farthest points - Most waste processing activities take place with dedicated buildings which are likely to provide containment of emissions - There are trees on the eastern boundary of the facility. These are likely to provide screening of odours during leafed periods and generate turbulent flow locally throughout the year, which will help promote the effective dispersion of emissions - Moderate frequency of winds from source to receptor (35.80%)
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5.2.3 The above information has been used to assess odour risk from the identified sources. This is summarised in Table 19.

Table 19 Odour Risk Assessment

Source		Source Odour Potential	Pathway Effectiveness	Exposure Risk	Sensitivity of Receptor	Effect Significance
1	SUEZ Recycling and Recovery UK	Medium	Moderately effective	Low	High	Slight

5.2.4 As shown in Table 19, the predicted odour effect significance was **slight** as a result of emissions from SUEZ Recycling and Recovery UK.

6.0 DISCUSSION

6.1 Field Odour Surveys

6.1.1 A range of odours were detected during the Field Odour Surveys, as shown in Table 12 to Table 14. These included refuse, food waste, sulphide, faecal, smoke and vegetation. The observations are discussed further in the following Section.

6.1.2 Faecal, refuse and sulphide type odours were detected during Survey 1. However, these odours resulted in **negligible** impacts in all cases. It should be noted that the faecal type odours were identified as being attributable to kennels on the existing site which will be

removed as part of the redevelopment. The refuse and sulphide odours were attributed to the SUEZ facility.

- 6.1.3 Refuse, food waste, faecal, smoke and vegetation type odours were detected during Survey 2. These odours resulted in **slight** impacts at locations 1 and 6 and **negligible** impacts at all remaining positions. The smoke type odours could not be attributed to a specific source during the monitoring. However, the refuse and sulphide odours were identified as being attributable to the SUEZ facility.
- 6.1.4 During Survey 3, vegetation type odours were detected at location 6. However, these odours resulted in **negligible** impacts. Refuse type odours were detected at the remaining positions and resulted in **slight** to **moderate** impacts. These were attributed to the SUEZ facility.
- 6.1.5 A summary of the impacts recorded across all surveys undertaken is provided as follows:
- 72.2% of all impacts recorded at the development site were **negligible**;
 - 16.7% of all impacts recorded at the development site were **slight**;
 - 11.1% of all impacts recorded at the development site were **moderate**; and,
 - 0% of all impacts recorded at the development site were **substantial**.
- 6.1.6 As shown above, proportional analysis of the results indicates that 88.9% of all impacts recorded ranged between **negligible** and **slight**, whilst 11.1% of all impacts recorded were **moderate**. However, it should be noted that these were only predicted at two locations across the entire development and during a single Survey. As such, it is considered that there is an overall low probability of exposure to levels which have the potential to result in **moderate** impacts and the maximum effect as a result of emissions from the Suez facility is therefore likely to be **slight**.
- 6.1.7 It should be noted that all Field Odour Surveys were undertaken when the development was downwind of the Suez plant. As such, the results are considered to provide a worst case assessment of existing conditions at the site. Furthermore, as shown in Section 5.1, low wind speeds were experienced during all three surveys. These can contribute to poor dispersion and dilution of emissions. As a result, receptors close to the source are

susceptible to odour impacts, as stated in IAQM guidance¹³. Thus, if impacts were likely as a result of emissions from the facility, it is anticipated they would be detectable under these conditions.

- 6.1.8 In overview of the Field Odour Survey results, although odours associated with the Suez facility were detected at the site, exposure at the development is not expected to be at a level to cause loss of amenity for future residents. The information gathered therefore did not provide any reason to constrain the development on odour grounds.

6.2 **Risk Assessment**

- 6.2.1 The Odour Risk Assessment indicated that the predicted odour effect significance was **slight** as a result of emissions from SUEZ Recycling and Recovery UK. This conclusion is consistent with the overall findings of the Field Odour Surveys and is due to a number of considerations, including the following:

- The size and nature of the facility and associated activities;
- The proximity of the facility to the proposed development;
- The prevailing meteorological conditions;
- The potential for the generation of moderately offensive odours as a result of waste processing operations; and,
- The potential for containment of odours within buildings at the facility.

- 6.2.2 It should also be noted that the SUEZ facility operates as an A(1) installation under an Environmental Permit issued by the EA (Ref: GB3907KB/T001). In accordance with the provisions of the Environmental Permitting (England and Wales) Regulations (2016) and subsequent amendments, this will include appropriate conditions to restrict environmental impacts beyond the boundary of the site. These will help to limit the potential for any effects at the development as a result of odour emissions from facility.

- 6.2.3 In the event that future emissions from the facility result in odour impacts at the development, the EA have the authority to serve an improvement notice that requires remedial works to be undertaken to reduce impacts to an acceptable level. As stated in Section 2.3, the measures that are deemed appropriate depend on the industry sector

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

and site-specific circumstances. However, should appropriate actions not be taken by the operator then the regulator has a number of available options, cumulating in the revocation of the Environmental Permit and cessation of all activities on site.

- 6.2.4 It should be noted that in accordance with the requirements of the NPPF¹⁴, the planning regime must work on the basis that the Environmental Permitting process will be effective in controlling impacts. This is consistent with recent planning appeal decisions, such as that for Appeal Ref: APP/P3420/W/15/3138033.

6.3 Summary

- 6.3.1 Three Field Odour Surveys were undertaken in accordance with the IAQM methodology. The findings indicated that emissions from the Suez facility are predicted to result in impacts which range between **negligible** and **moderate** across the proposed development site. However, proportional analysis of the results suggests that there is an overall low probability of exposure to levels which have the potential to result in **moderate** impacts and the maximum effect as a result of emissions from the Suez facility is therefore likely to be **slight**.
- 6.3.2 The risk of potential odour effects at the development was also 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 **slight** at the development which is consistent with the overall findings of the Field Odour Surveys.
- 6.3.3 In consideration of the assessment results, it is predicted that although odour from the Suez facility may be experienced at the development during specific conditions, this is not likely to cause significant effects. As such, the overall predicted impact is considered to be **slight**.
- 6.3.4 The IAQM guidance¹⁵ states that only if the impact is greater than **slight**, the effect is considered **significant**. As such, the overall effects of odour on the proposed development are considered **not significant**, in accordance with the stated methodology.

¹⁴ NPPF, Ministry of Housing, Communities and Local Government, 2021.

¹⁵ Guidance on the Assessment of Odour for Planning, IAQM, 2018.

- 6.3.5 Based on the assessment results, odour is not considered to represent a constraint to planning consent for the development.

7.0 CONCLUSION

- 7.1.1 Azymuth Acoustics UK was commissioned by BGI – Housing Development to undertake an Odour Assessment in support of the redevelopment of an existing residential site on land off Every Street, Bury.
- 7.1.2 The site is located to the east of the SUEZ Recycling and Recovery UK waste management facility. Odour emissions associated with operations at the plant may have the potential to affect amenity levels at the development. As such, an Odour Assessment was undertaken in order to determine baseline conditions at the site and evaluate the potential for impacts.
- 7.1.3 Three Field Odour Surveys were undertaken in accordance with the IAQM methodology. The findings indicated that odour impacts as a result of emissions from the SUEZ facility ranged between **negligible** and **moderate** at the development. However, proportional analysis of the results suggested that there is an overall low probability of **moderate** impacts and the maximum effect as a result of emissions from the Suez facility was therefore concluded to be **slight**.
- 7.1.4 The risk of potential odour effects at the development as a result of emissions from the facility was also 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 **slight** at the proposed site.
- 7.1.5 In accordance with the stated guidance, and in consideration of the Field Odour Survey results, the Risk Assessment results and the legislative controls associated with emissions from the SUEZ facility, the overall odour effects are considered to be **not significant**. As such, odour emissions from SUEZ Recycling and Recovery UK are not considered a constraint to planning consent for the development.

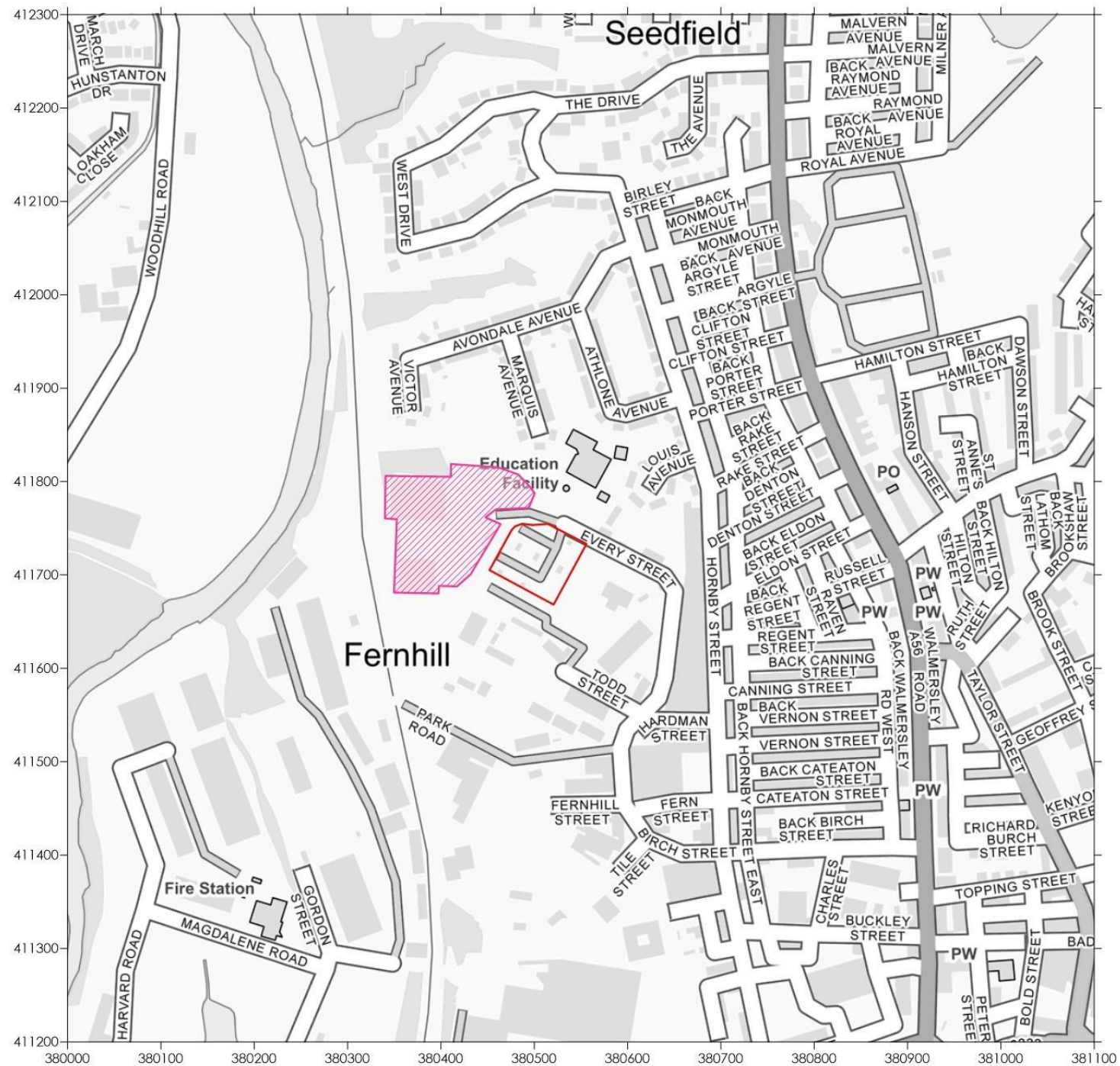
8.0 **ABBREVIATIONS**

BC	Bury Council
DEFRA	Department for Environment, Food and Rural Affairs
EA	Environment Agency
I_{max}	Maximum odour intensity
I_{mean}	Average odour intensity
IAQM	Institute of Air Quality Management
NGR	National Grid Reference
NPPF	National Planning Policy Framework
ODT	Odour Detection Threshold
$t_{\geq 4}$	Percentage odour time
UDP	Unitary Development Plan



Figures





Legend



Site Boundary



SUEZ Recycling and Recovery UK

Title

Figure 2 - Potential Odour Source

Project

Odour Assessment
Every Street, Bury

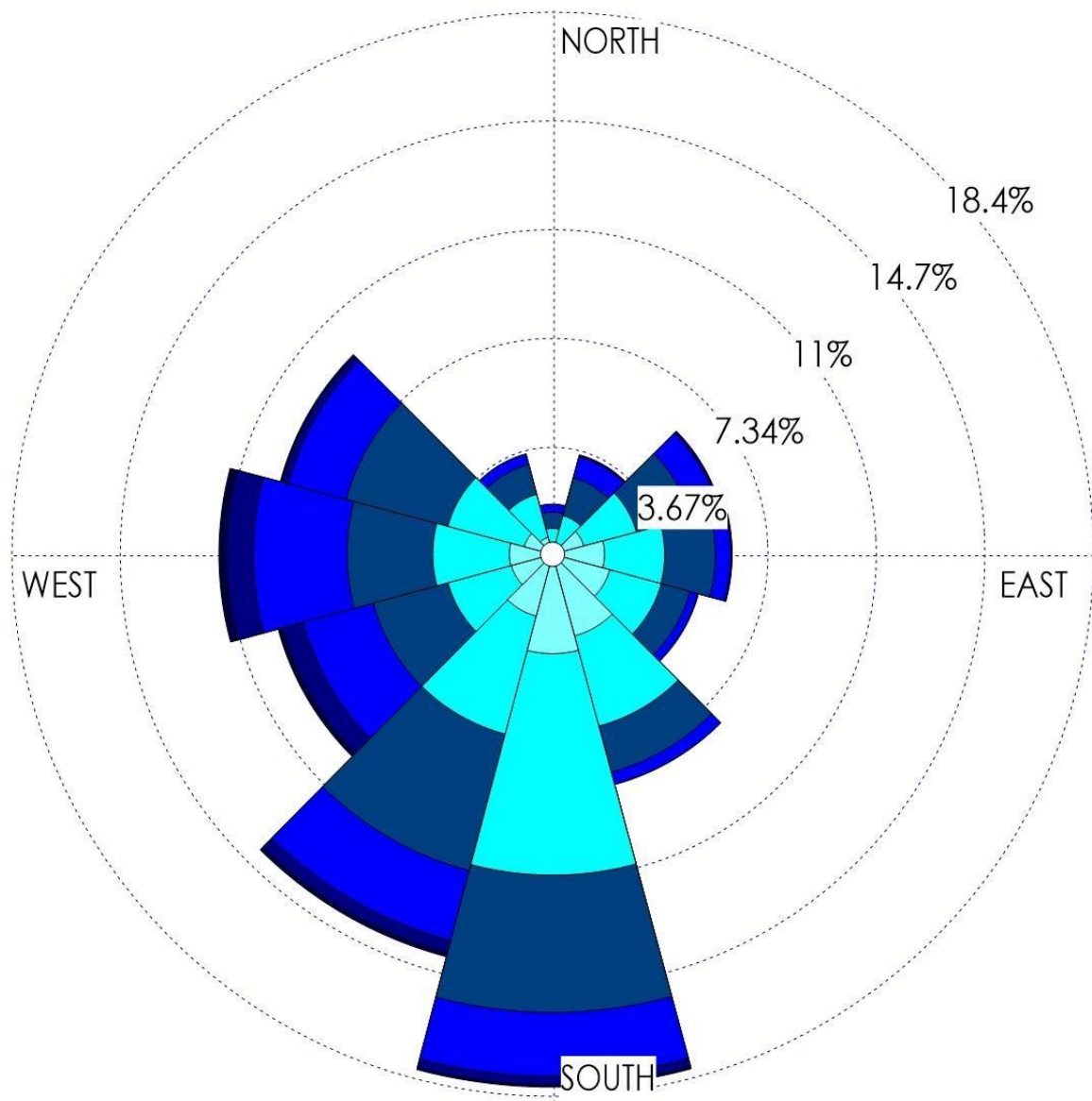
Project Reference

4303-1

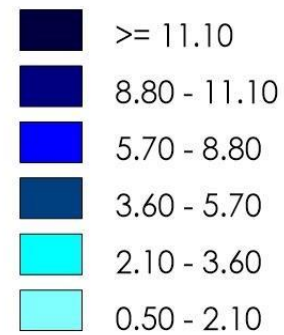
Contains Ordnance Survey Data
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Azymuth Acoustics UK
Professional Acoustic Services



WIND SPEED
(m/s)



Calms: 1.93%

Legend

Title

Figure 3 - Wind Rose of 2015 to 2019
Manchester Airport Meteorological
Data

Project

Odour Assessment
Every Street, Bury

Project Reference

4303-1

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