



LAND AT HIGH STREET, GRIMETHORPE,
BARNLEY, SOUTH YORKSHIRE

Odour Assessment

On Behalf of MG Architectural Designs
March 2024

Document Control Sheet

Project Name: Land at High Street. Grimethorpe, Barnsley, South Yorkshire

Project Ref: 0302

Report Title: Odour Assessment

Client	MG Architectural Designs
Job Number	0302
Item	Odour Assessment
File Location	/Greenavon/Job Numbers/0302/Reports/0302A(Od)v0.docx

Quality Management

Prepared by	Harley Parfitt	Air Quality Consultant	18/03/2024
Checked by	Harley Parfitt	Air Quality Consultant	20/03/2024
Revision Number	V0		

Revision History	Date of Issue	Reason for revision
V0	20/03/2024	Draft for client comment

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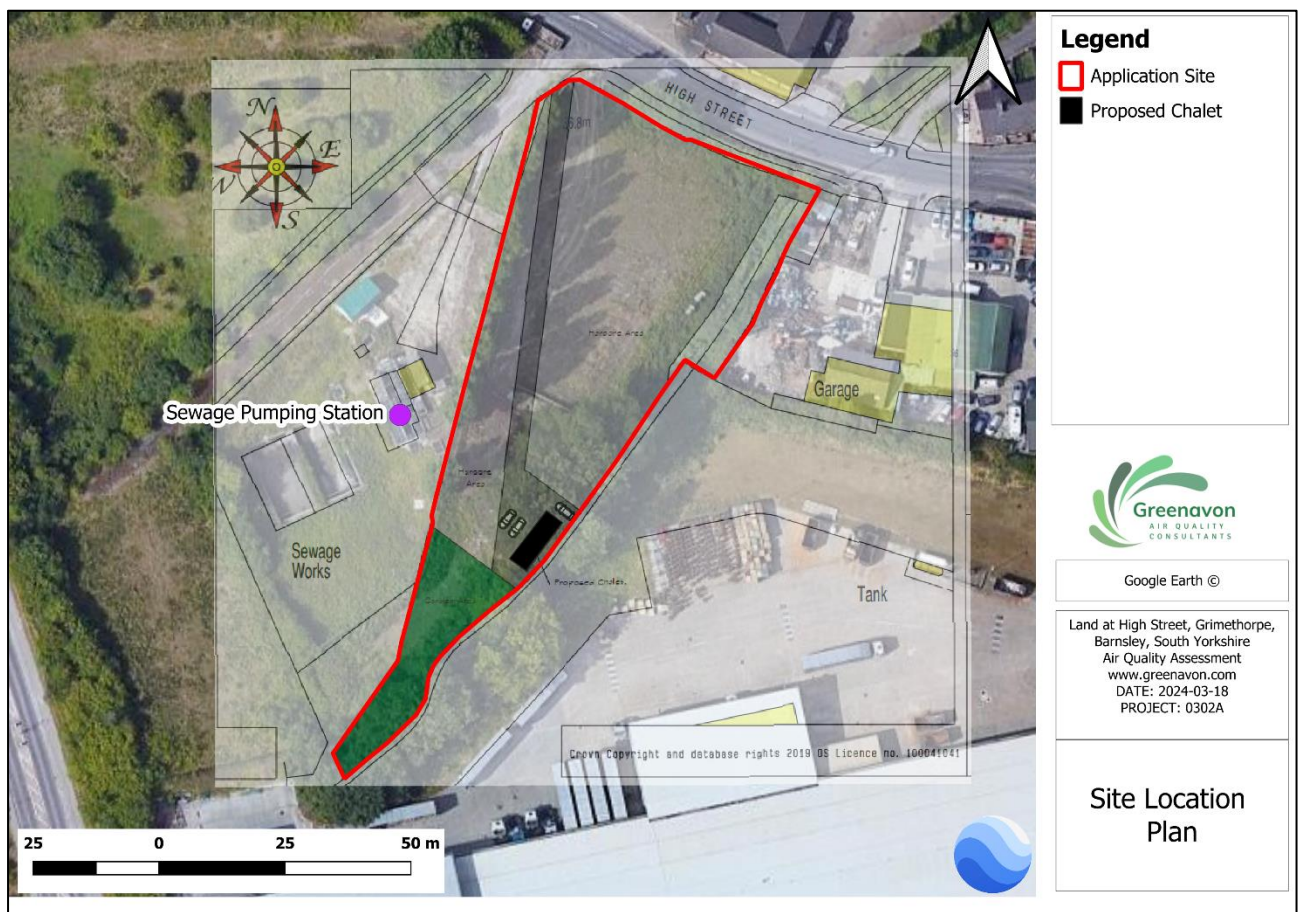
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1 Introduction

- 1.1 Greenavon Ltd was commissioned by MG Architectural Designs (“the Client”) to provide an Odour Assessment to support a planning application, to Barnsley Metropolitan Borough Council (BMBC), for a temporary residential development at Land at High Street, Grimethorpe, Barnsley, South Yorkshire. A Site Location Plan is displayed in Figure 1.1, below.
- 1.2 The proposal seeks temporary (2 year) permission for a residential chalet on disused industrial land. A sewage pumping station (SPS), managed by Yorkshire Water, borders the application site’s western boundary. Pumping stations help pump wastewater to the local sewage treatment works.
- 1.3 Due to the proposal’s proximity to this SPS, BMBC has requested that an odour assessment accompany the application, to ensure that the proposal would not be significantly affected by odours.
- 1.4 This report assesses the proposed development’s sensitivity to the local odour climate in line with best practice Institute of Air Quality Management (IAQM) *odour guidance for planning*.

Figure 1.1: Site Location Plan



2 Policy Context

- 2.1 Odour in the UK is controlled by three principal legislative regimes. The planning system controls the siting of development that is odorous and sensitive to odour, whilst the Environmental Permitting (EP) Regulations¹ require the control of pollution including odour, from certain installations. Finally, existing sources of odour must not unreasonably or substantially interfere with the enjoyment of another premise, as part of the Statutory Nuisance provisions of the 1990 Environment Act².

National Planning Policy

- 2.2 The revised National Planning Policy Framework (NPPF)³, updated in December 2023, sets out the government's planning policies for England and how these are expected to be applied. A key aim of the NPPF is to promote sustainable development and protect the natural environment. The NPPF contains policy of relevance to odour including paragraph 180, which states:

“Planning policies and decisions should contribute to and enhance the natural and local environment by: [...]

preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans.”

- 2.3 Paragraph 191 relates to the appropriate siting of development and the assessment of cumulative effects, stating:

“Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development.”

- 2.4 Paragraph 193 refers to the principal of the “Agent of Change” and states:

“Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or ‘agent of change’) should be required to provide suitable mitigation before the development has been completed.”

¹ The Environmental Permitting (England and Wales) Regulations 2016 (SI/1154)

² Environmental Protection Act 1990 - Part 3 Statutory Nuisances and Clean Air

³ Ministry of Housing, Communities & Local Government (2023) National Planning Policy Framework

Local Planning Policy

- 2.5 BMBC's Local Plan⁴ contains policy of relevance to odour, including *Poll1 Pollution Control and Protection*, which states:

“Development will be expected to demonstrate that it is not likely to result, directly or indirectly, in an increase in air, surface water and groundwater, noise, smell, dust, vibration, light or other pollution which would unacceptably affect or cause a nuisance to the natural and built environment or to people.

We will not allow development of new housing or other environmentally sensitive development where existing air pollution, noise, smell, dust, vibration, light or other pollution levels are unacceptable and there is no reasonable prospect that these can be mitigated against.

Developers will be expected to minimise the effects of any possible pollution and provide mitigation measures where appropriate.”

Odour Guidance

- 2.6 This assessment has been undertaken with reference to the following national guidance:
- IAQM (2018) Guidance on the assessment of odour for planning⁵.
 - Environment Agency (EA) H4 Odour Management Guidance⁶.
 - Scottish Environmental Protection Agency (SEPA) Odour Guidance⁷.

⁴ BMBC (2019) Local Plan: <https://www.barnsley.gov.uk/services/planning-and-buildings/local-planning-and-development/our-local-plan/barnsleys-local-plan/>

⁵ IAQM (2018) Guidance on the assessment of odour for planning: <https://www.iaqm.co.uk/text/guidance/odour-guidance-2014.pdf>

⁶ EA (2011) H4 Odour Management - how to comply with your environmental permit: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/296737/geho0411btqm-e-e.pdf

⁷ SEPA (2010) Odour Guidance: https://www.sepa.org.uk/media/154129/odour_guidance.pdf

3 Methodology

- 3.1 Best practice IAQM⁵ and EA H4 guidance⁶ advocate that multiple tools should be used in odour assessments to develop a “weight of evidence” to support any conclusions, as individual tools have their own inherent strengths and weaknesses.
- 3.2 IAQM guidance advocates that for existing sources, “*considerable weight should normally be given to the observational findings of community-based tools (complaints analysis, community surveys and odour diaries) and sensory assessments (such as sniff tests)*”. Considering the above, the following assessment techniques and sources of information were identified as most suitable for the assessment:
- An odour sniff test; and
 - Qualitative risk assessment, including an analysis of meteorological data.

Sniff Test

- 3.3 The perception of an odour is inherently subjective, with notable disparities in the population’s sensitivity to different scents. Furthermore, an individual’s personal experiences significantly influence their judgement of whether an odour is offensive. This highlights the complex and personal nature of our olfactory experiences.
- 3.4 Odour surveys (or sniff tests) involve the use of a trained assessor’s sense of smell to evaluate an odour in a robust and reproducible framework. An odour survey was undertaken in line with the methodology outlined in Box 4 of the IAQM’s latest odour guidance for planning.
- 3.5 The method involves taking multiple inhalable samples at each survey location over a span of 5 minutes. The intensity of each sample is then documented using the VDI odour intensity scale, which ranges from 1 to 6 (weak to extremely strong).
- 3.6 From this information, the pervasiveness of strong odours (number of samples where the intensity is 4 or greater) and the average odour intensity is calculated, for each location. The odour exposure, or impact, at each location, can then be determined using the matrix set out in Table 3.1.

Table 3:1 Matrix to assess the odour exposure (impact) at individual locations

Table 15: Matrix to assess the odour exposure (neutral and unpleasant odours) at time and place of sampling

Average Intensity (I_{mean})	Percentage odour time (t_{124}) during the test				
	10%	11 to 20%	21 to 30%	31 to 40%	≥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

Notes: I_{mean} should be rounded to the nearest whole number.
The following overriding considerations affect the scoring of the odour annoyance impact:
if $I_{mean} = 0$, then the odour effect can for practical purposes be considered negligible; and
if $I_{mean} = 1$ but $t_{124} = 0\%$, then the odour effect can for practical purposes be considered negligible.

3.7 After the odour exposure at each location has been calculated, the matrix in Table 3.2 can then be used to determine the effect, by combining the exposure with the location's sensitivity to odour. Residential dwellings are considered of high sensitivity to odours.

Table 3:2 Matrix to assess the odour effect at individual receptors

Table 16: Matrix to assess the odour effect at individual receptors

		Receptor Sensitivity (refer to Table A1.1)		
		Low	Medium	High
Overall Odour Exposure	Very Large	Substantial adverse	Substantial adverse	Substantial adverse
	Large	Moderate adverse	Moderate adverse	Substantial adverse
	Medium	Slight adverse	Slight adverse	Moderate adverse
	Small	Negligible	Negligible	Slight adverse

A further application of professional judgement then needs to be applied to conclude the significance of the odour effect on, or from, the development as a whole, taking into account the possibly different magnitudes of effects that occur at different receptors.

- 3.8 Several steps were taken to safeguard the quality of the odour survey including:
- The odour assessor had their nose calibrated and was found to have a slightly above average odour sensitivity (a score of 9.5 out of 15, using n-butanol pens (St Croix Sensory)).
 - The odour assessor was in full health, with no cold or flu symptoms.
 - The assessor consumed no confectionery, soft drinks, or food in the thirty minutes prior to the survey.
 - The assessor used no scented toiletries, perfumes or aftershave, which might desensitize their sense of smell, prior to the survey.
- 3.9 It should be noted that odour surveys only provide a snapshot of the odour environment at a particular time. As such the odour assessment was timed in an attempt to capture conservative conditions (i.e., when the wind was blowing from the direction of the SPS).
- 3.10 IAQM guidance advocates that at least three surveys should be carried out under different environmental conditions, to support odour assessments. It should, however, be noted that only one survey was undertaken, following initial discussions with the client.

Odour Risk Assessment

- 3.11 IAQM guidance provides an odour risk assessment methodology based on the source-pathway-receptor (S-P-R) conceptual model, where the odour effect is a function of the *source* emission magnitude, duration and frequency, the effectiveness of the *pathway* to carry the odour to the *receptor*, as well as the inherent sensitivity of the *receptor*.
- 3.12 The steps of the S-P-R assessment involve determining the risk of odour exposure (impact) at a location. This is undertaken by classifying the source odour potential as either small, medium or large, and factors that influence the odour potential include the offensiveness of the odour, the size of the installation, as well as the duration and frequency of any emissions from it.
- 3.13 The effectiveness of the pathway is determined as either ineffective, moderately ineffective, or highly effective based on the receptor's distance to the source, the

prevailing wind direction, the design of the discharge point (e.g., stack design), as well as the effect of any barriers or terrain between the source and the receptor.

- 3.14 The risk of odour exposure at any location is then determined using the criteria set out in Table 3.3 below, with the overall effect of that exposure dependent on the sensitivity of the end-use, and the matrix set out in Table 3.4.

Table 3:3: Risk of Odour Exposure (Impact)

Table 10: Risk of odour exposure (impact) at the specific receptor location

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

Table 3:4: Likely magnitude of Odour effect

Table 11: Likely magnitude of odour effect at the specific receptor location

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

Overall Judgment of Significance and the Weight of Evidence

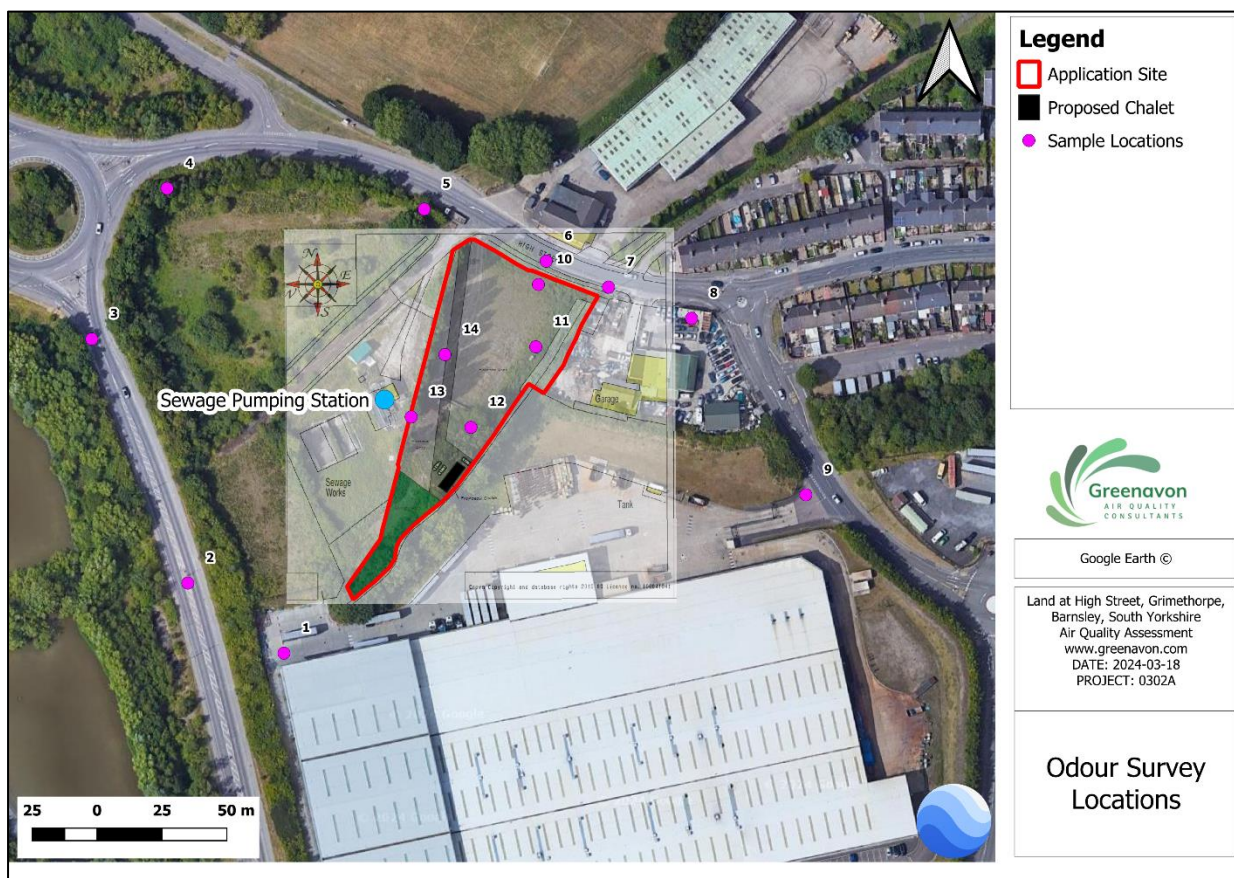
- 3.15 Whilst the criteria outlined above provide a convenient means to describe impacts at specific receptors, the overall effect and significance of any odour impact has been based on professional judgment, drawing together the results of the individual tools, as well as uncertainty in the methods.
- 3.16 Where the odour emission source is an existing process, IAQM guidance recommends that significant weight should be placed on the results of observational tools (e.g. sniff tests).
- 3.17 IAQM guidance states that overall effects considered *Moderate* or greater should be considered significant.

4 Results

Odour Survey

- 4.1 The sniff test was carried out between 14:27 and 15:55, on the 12th March 2024. Weather conditions were considered appropriate for a survey as winds were light (between 0-11mph, with slight intermittent gusts) and from the southwest to west-southwest. There were accessible parts of the application site downwind of the SPS.
- 4.2 In line with best practice, the survey started upwind of the principal odour emission source and gradually moved towards the location of likely highest odour impact (i.e. downwind of the SPS, at the border of the application site). The location of the samples, relative to the SPS, are shown in Figure 4.1.

Figure 4.1: Survey Locations



- 4.3 The results of the odour sniff test are presented in Table 4.1 below.

Table 4.1: Summary of Odour Sniff Test

Time	Location	Average Intensity (VDI)	Maximum Intensity	Pervasiveness (% Of Strong Odours)	Descriptors	Odour Exposure	Odour Effect
14:27-14:32	1	1	3	0.0%	Fuel fumes *whiff of dog poo	Negligible	Negligible

14:33-14:37	2	1	3	0.0%	Fuel fumes	Negligible	Negligible
14:38-14:43	3	1	3	0.0%	Fuel fumes	Negligible	Negligible
14:44-14:49	4	1	4	3.3%	Fuel fumes	Negligible	Negligible
14:51-14:56	5	0	1	0.0%	Earthy/damp/wet ground	Negligible	Negligible
14:57-15:02	6	0	2	0.0%	Earthy/damp/wet ground	Negligible	Negligible
15:03-15:09	7	1	3	0.0%	Chemicals/paint/varnish/grease/fuel	Negligible	Negligible
15:10-15:16	8	2	4	20.0%	Chemicals/paint/varnish/fuel/metallurgical/rubber/burny	Small	Negligible
15:17-15:22	9	1	3	0.0%	Trees/nature/earth/whiff of food	Negligible	Negligible
15:27-15:32	10	1	2	0.0%	Trees/nature/earth/chemicals	Negligible	Negligible
15:34-15:38	11	1	2	0.0%	Fresh/floral/grassy	Negligible	Negligible
15:40-15:44	12	1	3	0.0%	Trees/nature and whiff of waste	Negligible	Negligible
15:47-15:51	13	1	3	0.0%	Trees/nature and whiff of waste	Negligible	Negligible
15:52-15:55	14	0	1	0.0%	Trees/bark/wet ground	Negligible	Negligible

Odour intensity based on German VDI scale ranging from 0 (no odour) to 6 (extremely strong odour)

- 4.4 The data in Table 4.1 show that strong odours (intensity greater than 4) were only detected at Location 8 and Location 4. At Location 8, odour exposure was *small*, with reference to IAQM impact descriptors. Location 8 is adjacent to a car garage, 37m from the application site boundary, and over 100m from the proposed dwelling. The likely source of the strong odour at Location 4 was identified as coming from idling vehicles at the roundabout.
- 4.5 At all other locations, average odour intensity was a maximum of 1, on the VDI intensity scale (i.e., very weak) and no strong odours (>VDI 4) were detected.

- 4.6 Whilst some 'distinct' odours (VDI of 3), described as 'waste' and 'chemicals', likely associated with the SPS were detected across the application site, and in the vicinity of the proposed dwelling, these were experienced transiently.
- 4.7 Odour exposure and the odour effect across the application site (Locations 10-14) were *negligible*, with reference to best practice IAQM guidance.

Odour Risk Assessment

- 4.8 This odour risk assessment has been produced in line with best practice IAQM guidance, with insight into the odour potential of the SPS based on satellite imagery, and information provided by Yorkshire Water.

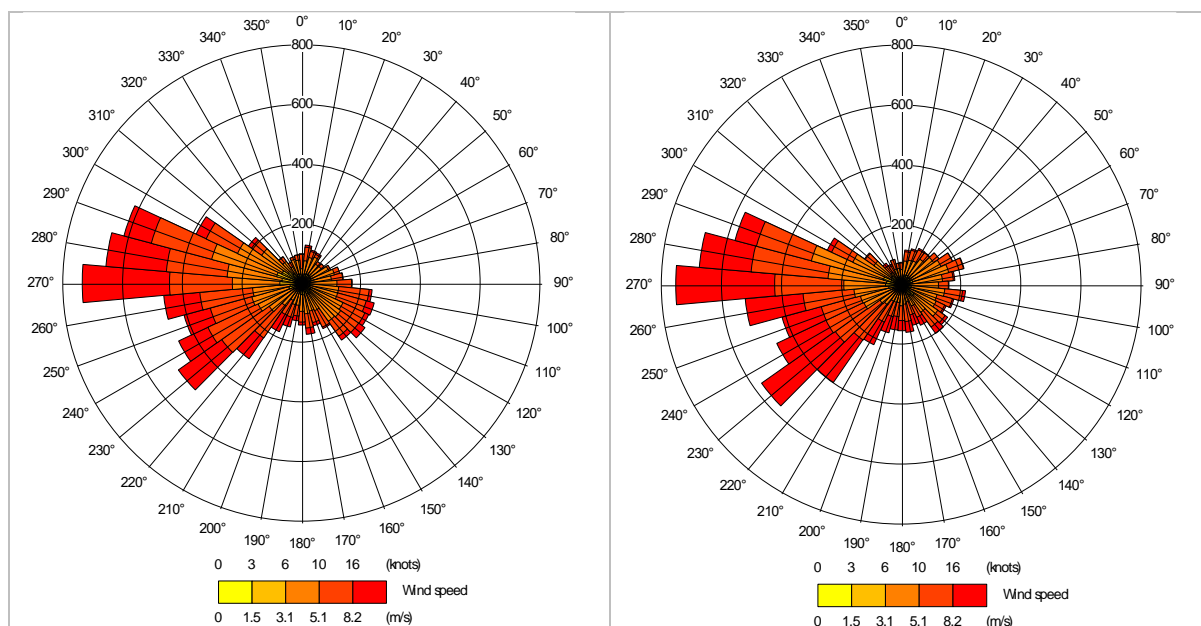
Source Magnitude

- 4.9 The significance of an odour is generally evaluated against the 'FIDO' criteria, which describe its 'Frequency', 'Intensity', 'Duration' and 'Offensiveness'. For example, an intense and offensive odour may not be considered significant if it only occurs infrequently, and for short periods. Whilst a constant inoffensive odour may be considered significant.
- 4.10 IAQM guidance provides examples of what may constitute a 'small' source odour potential, stating that where a process falls below the Part B Environmental Permit threshold, it could be considered *small*. It does, however, note that small sewage treatment works, and processes producing 'moderately offensive odours' may be considered as having a 'medium' source odour potential. As such, the SPS is considered to have a 'medium' odour potential.

Pathway Effectiveness

- 4.11 Figure 4.2 and Table 4.2 display a detailed breakdown of the wind direction at Emley Moor meteorological station, the closest meteorological station to the application site, between 2019 and 2022. The breakdown is also provided for the summer period in Table 4.2 as odour exposure is generally higher in summer, as people are more likely to be outside or to open their windows.

Figure 4.2: Windrose for Emley Moor (2019-2022)



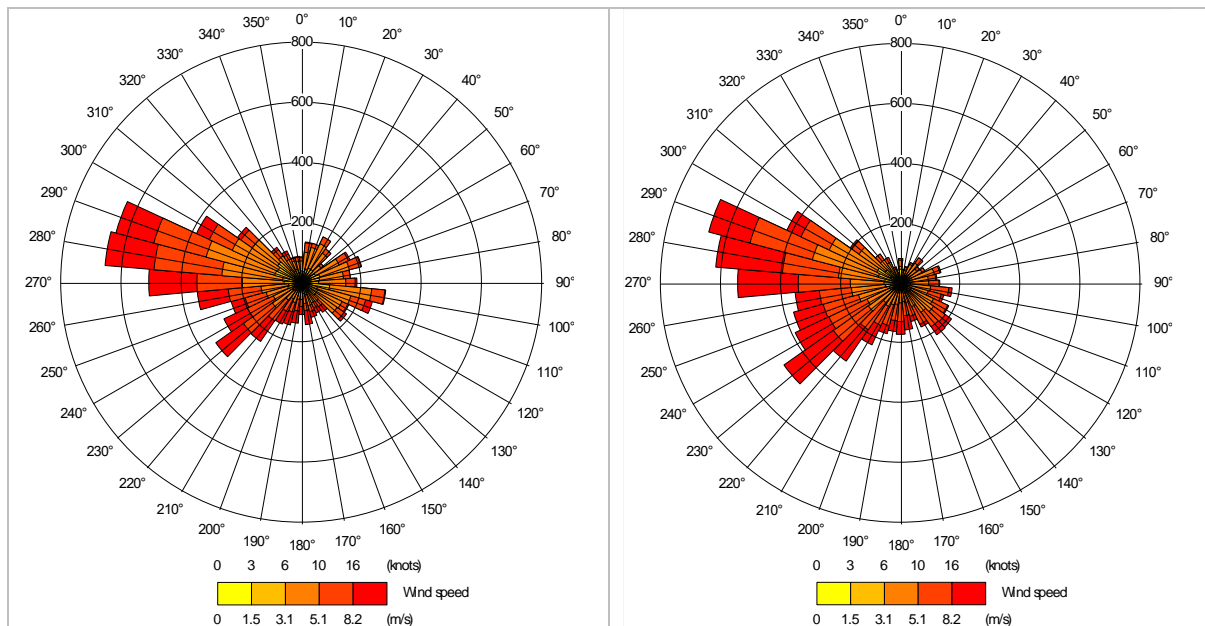


Table 4:2: Emley Moor Meteorological Data (2019-2022) by Wind Direction

Direction	Year	Summer
N	3.4%	4.2%
NNE	2.7%	3.7%
NE	2.5%	3.4%
ENE	3.6%	4.2%
ESE	6.2%	7.9%
ESE	4.6%	4.1%
SE	4.6%	4.3%
SSE	3.3%	2.7%
S	5.2%	4.7%
SSW	4.1%	3.5%
SW	9.0%	8.7%
WSW	8.6%	8.6%
W	19.5%	19.7%
WNW	11.2%	12.8%
NW	3.7%	3.3%
NNW	2.0%	2.1%
Missing	5.6%	2.2%

4.12 The proposed chalet and garden space is located between the south and east southeast of the sewage treatment works. The two tanks in the SPS, which appear as large rectangles in Figures 4.1 and 4.2 are not understood to be in-use, with vegetation growing within them both.

- 4.13 Winds from the north to the west northwest were uncommon between 2019 and 2022, occurring for just 20.3% of the time. It should, however, be noted that calm conditions would also likely lead to a build-up in odours in the local area.
- 4.14 In summer, winds from the north to the west northwest occurred for 22.4% of the time. The direction of wind in summer is important as members of the public are more likely to be outside, or opening windows, and thus at greater risk of exposure to odours.
- 4.15 The prevailing wind is from the west, which would not directly carry odours from the SPS to the proposed chalet. Despite being only 30m from the SPS, the pathway to the residential receptors is considered only *moderately* effective, based on the infrequency of winds blowing from the SPS, as well as the line of trees between the SPS and the application site.
- 4.16 The results of the odour risk assessment are shown, below, in Table 4.1.

Table 4:3: Odour Risk Assessment

Receptor	Source Magnitude	Pathway Effectiveness	Receptor Sensitivity	Odour Exposure	Odour Effect
Proposed Chalet	Medium	Moderately Effective	High	Low Risk	Slight

- 4.17 The risk assessment in Table 4.1 suggests that the risk of odour exposure at the proposed chalet, and gardens, would be *slight*, which is *not significant*.

5 Discussion

- 5.1 Local and National planning policy seeks to prevent development from causing, or being put at risk of, unacceptable odour impacts.
- 5.2 In line with EA and IAQM guidance, a suite of methods including sniff tests, a review of weather data and a qualitative risk assessment, have been used to support the odour assessment.
- 5.3 The qualitative odour risk assessment was undertaken in line with best practice IAQM guidance and concluded that the risk of odour effects at nearby sensitive receptors was *slight*. The pathway of odours from the SPS to affect the proposal was considered, despite the short distance, only moderately effective, due to the infrequency of winds from the north to west northwest.
- 5.4 One sniff test was undertaken on the 12th March 2024, when light winds were blowing from the south west. Whilst odours associated with the SPS could be detected, these odours were not strong, and were experienced transiently. Overall odour exposure at any location within the proposed development was negligible, which would result in a *negligible* effect, according to IAQM guidance. The odour assessor also has an acuity to odour that is slightly above average, suggesting that most people would have experienced less intense odours.
- 5.5 It should, however, be noted again that only one sniff test was undertaken, thus only providing a snapshot of the odour environment at a particular time. Whilst efforts were made to capture 'worst-case' conditions by attending site when the winds were light, the IAQM recommends that, at least, three sniff tests should be carried out under different environmental conditions to minimise uncertainty in any conclusions.
- 5.6 The proposed development would not be odour free and would likely at times experience strong odours from the adjacent SPS. However, when operating normally, odours from the SPS would not be considered highly offensive and would likely blow infrequently towards the proposed development. The sniff test suggests that these odours would not be strong, nor would be experienced constantly. As the planning application seeks only temporary permission and consists of a single dwelling, there would only be a few receptors on site, for a definite period. Considering the above, and using professional judgment, the overall odour effect at the proposed chalet is judged to be, at worst, *slight adverse*, which is not significant.

6 Conclusions

- 6.1 Greenavon Ltd was commissioned by MG Architectural Designs to provide an Odour Assessment to support a planning application, to Barnsley Metropolitan Borough Council (BMBC) for a temporary residential development at Land at High Street, Grimethorpe, Barnsley, South Yorkshire.
- 6.2 An odour assessment was required to assess the sensitivity of a proposed residential chalet to the odours from an adjacent sewage pumping station. The odour assessment used different tools, including a sniff test and risk assessment, to build a weight of evidence to support the conclusion.
- 6.3 Whilst not odour free, the overall odour effect at the proposed chalet is considered to be *slight*, which is not significant.
- 6.4 As the proposed development would not likely be significantly affected by odours, the proposed development is considered compliant with all national and local odour planning policy. Odour should not, therefore, present a significant barrier to the planning process.



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