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GLADMAN DEVELOPMENTS LIMITED

LAND OFF HENTHORN ROAD, CLITHEROE

ODOUR IMPACT ASSESSMENT

DECEMBER 2025

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DATE ISSUED:	**8th December 2025**
JOB NUMBER:	**GM13551**
REPORT NUMBER:	**002**
VERSION:	**V0.1**
STATUS:	**FINAL**

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DECEMBER 2025

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1 INTRODUCTION

1.1.1 Wardell Armstrong has been commissioned by Gladman Developments Ltd to undertake an odour impact assessment to accompany an outline planning application for a proposed residential development at Land off Henthorn Road, Clitheroe, Lancashire.

1.1.2 The proposed site is located to the south west of Clitheroe, Lancashire, and comprises fields that lie to the west and to the east of Henthorn Road. The site lies to the south-west of residential development in Clitheroe and is currently open agricultural land. The Clitheroe Wastewater Treatment Works (WwTW), operated by United Utilities (UU) is located approximately 135m south of the nearest boundary with the site.

1.1.3 From the information provided, we understand that the proposals are for a residential development comprising up to 115 dwellings and associated infrastructure.

1.1.4 The potential for the proposed development to give rise to other air quality impacts on the local area is considered in a separate Air Quality Assessment report also prepared by Wardell Armstrong (REF: GM13551/001).

1.2 Development and Planning Background

1.2.1 A detailed odour assessment of the Clitheroe WwTW was undertaken by Wardell Armstrong in June 2021 (REF:GM10325/004A/Final) as part of a planning application for Gladman Developments Ltd, which included the most recent information and data available at the time i.e. meteorological data for the five year period 2015 – 2019 and odour emission rate data obtained from a two day odour sampling exercise at the Clitheroe WwTW.

1.2.2 The assessment included extensive consultation with UU and involved detailed discussions over the implementation of a proposed mitigation measure at the WwTW to cover the sludge tanks and install an Odour Control Unit (OCU) to treat the odorous air from the tanks before release to atmosphere.

1.2.3 It is understood that the 2021 planning application was ultimately refused, however odour was not a reason for refusal and UU had no objection to the application 'subject to adequate mitigation being secured via planning condition and/or legal mechanisms'.

1.3 Current Assessment

1.3.1 This report is an update to the June 2021 assessment undertaken by Wardell

Armstrong to include the most recent five-year meteorological data (2020 -2024). UU have confirmed that no changes have taken place at the Clitheroe WwTW since the previous odour sampling exercise was completed.

1.3.2 Therefore, all emission rate data has been taken from the odour sampling exercise undertaken in June 2020 by Wardell Armstrong, with the exception of the Sludge Tank OCU which is a proposed mitigation measure and is therefore not currently in operation at the works. The odour sampling exercise undertaken in June 2020 was agreed with, and attended by, UU. The results of the sampling exercise are included in **Appendix A**.

2 PLANNING POLICY CONTEXT

2.1 Odour Legislation and Planning Policy

2.1.1 The Environmental Protection Act 1990[1] is the legal framework dealing with odour from industrial, trade or business premises. If odour is present in sufficient quantity, this may constitute a statutory nuisance. The Local Authority is placed under a duty to inspect, detect any nuisance and to serve abatement notices where necessary.

2.1.2 The National Planning Policy Framework (NPPF)[2], introduced in March 2012 and revised in December 2024 with a minor text update in February 2025, sets out planning policy for England. Paragraph 198 planning policies and decisions should ensure that "*development is appropriate for its location"* and that "*the 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"* should be taken into account.

2.1.3 The Planning Practice Guidance is an online based resource[3] which supports the NPPF. The Planning Practice Guidance does not give any definitions of odour nor does it provide any planning guidance in relation to odour. Within the Air Quality section, in Paragraph 001, odour is mentioned; *"Odour and dust can also be a planning concern, for example, because of the effect on local amenity".*

2.1.4 Pollution is defined within the Planning Practice Guidance as *"anything that affects the quality of land, air, water or soils, which might lead to an adverse impact on human health, the natural environment or general amenity. Pollution can arise from a range of emissions, including…odour".*

Environment Agency H4 Odour Management Guidance

2.1.5 The Environment Agency (EA) has produced a horizontal guidance note on odour management[4], designed for operators of EA regulated processes.

2.1.6 The guidance note recognises that not all odours have the same potential to cause annoyance and odours from, for example, sewage treatment tends to be more 'offensive' than, those from the brewing or baking industries. This has led to a suggested indicative odour exposure criterion of $3ou_E/m^3$ for odours associated with

[1] Environmental Protection Act, 1990

[2] Department for Communities and Local Government, National Planning Policy Framework, February 2025

[3] http://planningguidance.communities.gov.uk/

[4] Environment Agency, Technical Guidance Note H4 – Odour Management, 2011

wastewater treatment, compared to $6ou_E/m^3$ for brewery and bakery processes (98^{th} percentile of 1-hour mean concentration).

2.1.7 Odour can be detected at concentrations as low as $C_{98,\ 1\text{-hour}}$ $1ou_E/m^3$. As a very approximate guide:

- At $C_{98,\ 1\text{-hour}}$ 1 - $5ou_E/m^3$, the odour is recognisable;
- $C_{98,\ 1\text{-hour}}$ $5ou_E/m^3$ is classed as a faint odour; and
- $C_{98,\ 1\text{-hour}}$ $10ou_E/m^3$ is classed as a distinct odour.

2.1.8 The values for normal background odours such as from traffic, grass cutting, and plants amount to anything from 5 to $40ou_E/m^3$.

2.1.9 Odour is subjective and therefore what one person may find offensive the next person may not. A rapidly fluctuating odour is often more noticeable than a steady background odour at a low concentration. People can detect and respond to odour exposure that lasts as little as one or two seconds. Factors that are examined when considering the existence of a statutory nuisance are:

- Type of odour;
- Wind strength and direction;
- Duration of odour;
- Time of day; and
- How often it occurs.

Institute of Air Quality Management (IAQM)

2.1.9 The Institute of Air Quality Management have published Guidance for the assessment of odour entitled 'Guidance on the assessment of odour for planning'[5]. This guidance states what information, monitoring and report information is required for an odour assessment, in support of planning applications. The IAQM Guidance is the only UK odour guidance containing methods for estimating the significance of potential odour effect.

2.1.10 The IAQM guidance endorses the use of multiple assessment tools for odour, stating that, "*best practice is to use a multi-tool approach where practicable".*

2.1.11 The IAQM guidance recognises that all year-round site visits are often unfeasible due

[5] Institute of Air Quality Management (July 2018), Guidance on the Assessment of Odour for Planning

to the planning application's timetable, deadline and costs. However, the guidance still recommends that three site visits should be undertaken as a minimum, and that these visits should be representative of at least 70% of the Pasquill stability categories experienced at the site over the course of a year.

2.1.12 The Pasquill stability categories are a method for calculating turbulence based on wind speed, solar radiation and cloud cover.

2.1.13 The guidance also includes the use of the FIDOL (Frequency, Intensity, Duration, Offensiveness and Location) factors to determine the degree of odour pollution. Sniff tests are defined by a hedonic score, a quantitative value that assigns a value to the odour. The hedonic score varies from +4 (e.g. bakery smell) through neutral to highly unpleasant -4 (e.g. rotting flesh).

2.2 Significance

2.2.1 The EA H4 odour guidance states that a benchmark odour criteria of $C_{98,\ 1\text{-hour}}\ 3ou_E/m^3$ is applicable for odours associated with waste water treatment process, and is classed as a 'moderately offensive' odour source.

2.2.2 The Chartered Institute of Water and Environmental Management (CIWEM) also re-iterates this approach, and states:

> *"C98, 1-hour <3ouE/m3 - complaints are unlikely to occur and exposure below this level are unlikely to constitute significant pollution or significant detriment to amenity unless the locality is highly sensitive or the odour highly unpleasant in nature."*

2.2.3 Odours from WwTW's where septic influent and septic sludge sources occur are classed as 'Most Offensive'. Neither such odour sources are present at the Clitheroe WwTW and it is appropriate to apply the odour effect descriptors for 'Moderately Offensive' odours listed in within IAQM guidance and reproduced in Table 1 overleaf.

2.1.10 In accordance with Table 1 above (taken from the IAQM guidance), for highly sensitive receptors (such as the proposed residential dwellings) odour concentrations that exceed $C_{98,\ 1\text{-hour}}\ 3ou_E/m^3$ are considered to correlate to a 'Moderate Adverse' impact which is a 'significant' impact in accordance with guidance. Odour concentrations below this level are considered to be either slight adverse or negligible, which is 'not significant' in accordance with the guidance.

Table 1: Proposed Odour Effect Descriptors for impacts predicted by modelling – 'Moderately Offensive' Odours			
Odour Exposure Level $C_{98,\ 1\text{-hour}}$ ou_E/m^3	**Receptor Sensitivity**		
	Low	**Medium**	**High**
≥10	Moderate	Substantial	Substantial
5 - < 10	Slight	Moderate	Moderate
3 - < 5	Negligible	Slight	Moderate
1.5 - < 3	Negligible	Negligible	Slight
0.5 - < 1.5	Negligible	Negligible	Negligible
<0.5	Negligible	Negligible	Negligible

2.1.11 Based on the above, the IAQM guidance agrees with the EA guidance in that the $C_{98,\ 1\text{-hour}}$ $3ou_E/m^3$ odour benchmark criterion is suitable for moderately offensive odours at highly sensitive receptors.

2.1.12 Therefore, given the nature of the odour source (i.e. no septic sludge or influent at the Clitheroe WwTW) and the sensitivity of the proposed receptors (high), a benchmark criterion of $C_{98,\ 1\text{-hour}}$ $3ou_E/m^3$ is considered to be appropriate for use within the assessment (98th percentile of 1-hour mean concentration). Any area of the proposed development located outside of this benchmark criteria is considered suitable for residential development.

2.1.13 Numerous Inspectors have considered the evidence relating to appropriate criterion on which to determine residential amenity during planning appeals and adopted the $C_{98,\ 1\text{-hour}}$ $3ou_E/m^3$ odour criterion as an appropriate benchmark. One such appeal in which WA gave evidence, was for Land at Hill Farm, Hempstead, Gloucester Ref; APP/U1620/W/22/3296510 in which the inspector concluded:

> *"Although odour is to a degree a subjective matter, I am nevertheless satisfied the up to three odour unit concentration provides an appropriate benchmark to determine acceptability of potential impacts when using dispersion modelling results. Excluding housing from the three odour unit contours modelled would, I agree, facilitate acceptable living conditions for new residents within the appeal site."*

3 ASSESSMENT METHODOLOGY

3.1 Consultation and Scope of Assessment

3.1.1 Consultation relating to the requirements of the odour assessment was originally undertaken with United Utilities (UU), the operator of Clitheroe WwTW, in a series of communications between 20th June and 28th August 2019. A summary of this consultation is provided below:

- On 20th June 2019, an email containing the proposed methodology was sent to UU, outlining that a detailed odour assessment, using AERMOD software, was to be undertaken to assess the potential odour impact of the WwTW at the proposed development site;
- Sniff tests site visits would also be undertaken at the proposed development site over three site visits, the results of which would be used in conjunction with the results of the dispersion modelling to ascertain an overall odour impact conclusion;
- Mr Paul Kynaston, Process Engineer at UU responded via telephone on the 30th July 2019 to discuss the methodology and emission rate data to be used in the assessment. Mr Kynaston stated that the methodology was acceptable, and the following points were discussed and agreed:
    - The odour impact assessments will be based on receptor classification and exposure effect descriptors detailed in Table 6 of the IAQM guidance document V1.1
    - UU have no preference with regard to model used, but AERMOD is being used in this case
    - The modelling grid domain and predicted odour exposure will be limited to the potential development area only
    - Manchester Airport met data will be used in the assessment
    - No seasonal odour emission factors will be applied
    - The model will include the effects of terrain
    - Final settlement tanks will not be included in the model.
    - UU do not typically include the operation of storm tanks (i.e. tanks containing storm water) within OIAs, although depending on the site UU may consider including them to account for post storm residue or

residue within storm tank hoppers. UU recommend that allowance is made for this site.

- Tanker loading may be represented as a time varying source in the model and/or sensitivity analysis performed to determine if tanker loading emissions are an odour risk.

- On 1st August 2019, Mr Kynaston confirmed the above details in an email and provided the modelling input emission rate data to be used in the assessment.
- On 25th September 2019, Wardell Armstrong emailed UU to propose adjustments to the modelling emission data suggested by UU on 1st August. It was considered that many of the sources in the information provided contained elevated emission rates, whilst one source had an incorrect area measurement. It was confirmed by Mr Kynaston that the adjusted emission rates and sizes were acceptable.
- It was agreed that the use of meteorological data from Manchester Airport meteorological station was not fully representative of conditions on site, and so it was agreed to use Numerical Weather Prediction (NWP) data from the Met Office instead.
- Further consultation was undertaken whereby Mr Kynaston confirmed the storm tanks should be modelled as 10% of their overall size. This was to ensure the accuracy of the model as it is estimated that this figure is representative of the total area of each tank which generally contains remaining sludge following storm events. Mr Kynaston also provided a more detailed 'breakdown' of the different aspects of the Inlet works on 30th September 2019, in order to accurately reflect the different emission rates of each aspect.
- Further consultation was undertaken in January 2020 with UU over concerns that the model input data used in the assessment was not totally representative of actual conditions at Clitheroe WwTW. As a result, an odour sampling survey was undertaken at the works on 25th and 26th June 2020 by Olfasense. A copy of the report produced following the site visit is detailed in **Appendix A.**
- During the odour sampling of the odour sources at Clitheroe WwTW, the data was collected at various sources over two days. UU therefore advised using an average of the emission rates detailed in the Olfasense report. UU reviewed the sampling data and provided the average emission rates for use within the assessment via email on 9th July 2020.

- During this consultation, it was determined that the emission rate obtained for the storm tanks was obtained from just one of the five storm tanks, which was approximately 75% full of odorous sludge at the time of sampling. It was confirmed by the Olfasense sampling team on site that the other four storm tanks were empty at the time of sampling. UU requested that all five storm tanks were modelled as 75% full of odorous sludge using the emission rate obtained during the sampling.

3.2 Further consultation with UU relating to proposed mitigation at Clitheroe WwTW

3.2.1 Further consultation was undertaken with UU, relating to proposed mitigation measures at the Clitheroe WwTW, in a series of communications between 24th November 2020 and 27th April 2021. A summary of this consultation is provided below:

- On 24th November 2020, Wardell Armstrong emailed Mr Paul Kynaston, Process Engineer at UU, to discuss potential mitigation measures that could be adopted at Clitheroe WwTW in order to reduce odour emissions emitted from the WwTW;
- A conference call between Wardell Armstrong and UU was arranged on the 1st December 2020, during which the following mitigation measures were discussed:
    - <u>Storm Tanks</u>
        - UU could improve the cleaning of the storm tanks which would minimise the amount of residue left in the tanks following a storm event.
        - Storm tanks should be modelled to replicate the amount of residue left behind in the hopper/drain channel area only. This would be representative of approximately 5% of the total tank area and would be applied to all storm tanks.
    - <u>Raw Sludge Tanks</u>
        - Covers could be applied to these tanks, which would then have an Odour Control Unit installed to treat the odorous air extracted before release to atmosphere.
        - Two OCU options should be considered within the model – a carbon filter OCU and a Biofilter OCU, and the results compared to see which has the greatest odour reduction impact.

- UU confirmed that they would be able to provide the necessary emission rate and flow velocity data required to model the two different OCU scenarios.

- All final odour emission rates and flow velocity data were received and agreed with UU on 15th December 2020.
- Detailed odour modelling was undertaken using the new data, with initial indicative results presented to UU via email on 18th December 2020. UU confirmed receipt of the results via email the same day and stated the results would be shared with the Asset Manager so a decision on potential mitigation costs could be made.
- Several emails were sent between Wardell Armstrong and UU between January and April 2021 in relation to a decision on the overall costings associated with the potential mitigation measures that could be implemented at the works.
- The final 'Budget Estimate' document for potential odour mitigation measures at Clitheroe WwTW was received from UU via email on 27th April 2021. The document proposes a two stage OCU attached to the covered sludge tanks, whereby odorous air is treated with a Bio-trickling Filter (BFT) followed by activated carbon treatment.

3.3 Current Consultation with UU

3.3.1 Additional consultation has been undertaken with UU between November 2024 and February 2025 to discuss and confirm that the previous emission rate data and proposed OCU mitigation measure remain representative of current conditions at the Clitheroe WwTW. UU confirmed via email that the odour sources and unit area emission rates "remain unchanged", as should the OCU provided to mitigate the sludge tank emissions.

3.3.2 It was also clarified with UU that the only mitigation measure included in the current assessment is the proposed sludge tank OCU. The enhanced storm tank cleaning mitigation measure has not been taken forward and so has not been considered within the assessment.

3.4 Ribble Valley Borough Council Consultation

3.4.1 Consultation was also undertaken with Ms Nicola Clark, Environmental Health Officer at Ribble Valley Borough Council (RVBC) in a series of communications between 9th and 18th July 2019:

- A detailed odour modelling assessment was proposed, using AERMOD software and supplemented with 'sniff test' site visits at the proposed development site;
- Input data would be obtained directly from UU;
- Odour complaint history relating to Clitheroe WwTW was also requested.

3.4.2 Ms Clark confirmed via email on 18th July 2019 that the methodology was acceptable.

3.4.3 On 30th August 2019, it was confirmed by Ms Clark that the Council has no existing or previous odour complaint history relating to the Clitheroe WwTW.

3.4.4 Further consultation was undertaken with Michaela Gleave, Environmental Health Officer (EHO) at RVBC in July 2020 following the odour sampling survey at Clitheroe WwTW. Ms Gleave confirmed that the use of data from the sampling survey was acceptable and confirmed that the Council still has no record of odour complaint relating to the Clitheroe WwTW.

3.4.5 As this current odour assessment is an update to the previous assessment to include the latest meteorological data only, it is assumed that RVBC agreement to the methodology will remain, and no additional consultation has been undertaken.

4 PREDICTIVE ASSESSMENT – ODOUR DISPERSION MODELLING

4.1.1 Emissions to atmosphere from the Clitheroe WwTW have been modelled using AERMOD (Lakes Environmental). This is a proprietary quantitative dispersion model that is based upon the Gaussian theory of plume dispersion. The model uses all input data, including the characteristics of the release (i.e. rate, temperature, velocity, height, location, etc.), meteorological data and the locations of the buildings adjacent to the proposed emission points (where appropriate), to predict the concentration of the substance of interest at a specified point.

4.1.2 The model uses sequential hourly meteorological data and the locations of the buildings, to predict the concentration of each substance at each point for each hour over the course of a year. This allows long-term mean and short-term peak ground level concentrations to be estimated over the modelled area, as required.

4.1.3 The odour dispersion modelling has been carried out in accordance with guidance included within the EA H4 Odour Management document by including 5 years of meteorological data (2020-2024).

Model Inputs

Proposed Sensitive Receptor Locations

4.1.4 The assessment focuses on proposed sensitive receptors, as it considers the potential for odour effects within the development site.

4.1.5 The results of the assessment will be used to inform the masterplan for the proposed development, and therefore a uniform Cartesian grid has been modelled, which covers the entire site. The parameters of the modelled Cartesian grid are included in Table 2.

Table 2: Uniform Cartesian Grid Parameters

Parameter	X	Y
South West Grid Coordinates	372683.26	440080.93
Number of Points	40	35
Spacing (m)	20	20
Length (m)	780.00	680.00
Total Number of Grid Receptors	1400	

Meteorology

4.1.6 Meteorological data has the greatest impact of the determination of the dispersion of odour from a given source. In modelling terms, the meteorological data input into the model will determine the dispersion characteristics of odour from Clitheroe WwTW and therefore it will affect the distribution of contours of predicted odour levels across the development site.

4.1.7 It is considered that there is no representative meteorological station in the vicinity of the proposed development site. The suggested use of the Manchester meteorological station in the assessment was agreed to be unsuitable. Therefore, Numerical Weather Prediction (NWP) Meteorological data has been obtained from ADM Ltd for use in the model, and this is considered to be the most representative of on-site conditions.

4.1.8 Whilst still not fully representative of actual meteorological conditions experienced on site the use of this data in the assessment is considered to be more robust than using data from the Manchester meteorological recording station.

4.1.9 Five years of hourly sequential data (i.e. 2020 to 2024) have been obtained from ADM Ltd, with each year of data being considered separately within the model.

Surface Characteristics

4.1.10 The predominant characteristics of land use in an area provide a measure of the vertical mixing and dilution that is likely to take place in the atmosphere due to factors such as surface roughness and albedo.

4.1.11 The met data used within the assessment has been processed using AERMET software which allows for the incorporation of the surface characteristics around the proposed development site.

4.1.12 Examination of the local setting shows that site is semi-rural, with semi urban land uses to the north and north east, with more open, cultivated land to the east, west and south. There is woodland to the north and west of Clitheroe WwTW, which is approximately 85m and 45m deep, respectively. Surface roughness values used in the model have been increased from the cultivated land use values to a value of 0.75 to allow for the presence of the trees. The modelled results should therefore be more representative of the land-uses which surround the site.

Terrain

4.1.13 To consider the impact of terrain surrounding the site on the dispersion of pollutants,

x.y.z format terrain data has been used in the model.

Emission Parameters for Odour Sources

4.1.14 Details of the sources to be included in the model have been provided by and agreed with UU. All the sources considered are area sources in nature, and details have been provided of their area, heights and efflux velocity.

4.1.15 The modelling is based upon a potential mitigation measure that could be implemented at Clitheroe WwTW:

- Covers placed over the sludge tanks with a carbon Odour Control Unit installed to treat the odorous air extracted before release to atmosphere (STCK1).

4.1.16 All other emission sources at Clitheroe WwTW have been modelled using emission rates representative of current operations at the works.

4.1.17 The area sources and odour emission rates considered in the model are included in Table 3, whilst the point source odour emission rates are shown in Table 4. The locations of these sources are shown in **Appendix B**.

Table 3: Sources and Odour Emission Rates

Odour Source Model Reference	Odour Source Description	SW Corner / Centre Grid Reference		Emission Rate (OU/m²/s)	Area (m²)	Height (m)	Base Elevation (m)
		X	Y				
Polygon Sources							
PAREA1	ASP Anoxic Zone	373043	440185	4.2	192.7	1	55.16
PAREA2	RAS/SAS Wetwell	372982	440185	0.7	40.5	0	54.66
PAREA3A	Inlet Works Pre-screens	373168	440369	6.1	51.4	0	55.16
PAREA3B	inlet Works Post screens	373162	440359	6.1	84.0	0	54.66
PAREA4	Storm Tank 1	373134	440345	3.1	101.0	0	57.00
PAREA5	Storm Tank 2	373144	440342	3.1	101.3	0	57.00
PAREA6	Storm Tank 3	373066	440362	3.1	270.4	0	56.56
PAREA7	Storm Tank 4	373086	440364	3.1	270.1	0	56.35
PAREA8	Storm Tank 5	373105	440365	3.1	237.8	0	56.45
PAREA10	ASP Aeration 1st Zone	373005	440194	2.7	224.4	1	55.16
PAREA11	ASP Aeration Final Zone	372988	440194	0.7	223.4	1	54.66

Table 3: Sources and Odour Emission Rates							
Odour Source Model Reference	Odour Source Description	SW Corner / Centre Grid Reference		Emission Rate (OU/m²/s)	Area (m²)	Height (m)	Base Elevation (m)
		X	Y				
Circular Sources							
CAREA1	Primary Tank 1	373078	440287	4.8	227.0	0	56.02
CAREA2	Primary Tank 2	373098	440289	4.8	227.0	0	56.12
CAREA3	Tanker Loading Point	373086	440196	140	1.1	0.75	56

Table 4: Sources and Odour Emission Rates – Point Sources								
Odour Source Model Reference	Odour Source Description	SW Corner / Centre Grid Reference		Emission Rate (OU/m²/s)	Diameter (m)	Exit Velocity (m/s)	Height (m)	Base Elevation (m)
		X	Y					
Polygon Sources								
STCK1	Sludge Tank Carbon OCU	373092	440200	153	0.11	15	9	56.00

4.1.18 All emission rates have been agreed with UU and are based on the odour sampling survey undertaken by Olfasense at Clitheroe WwTW on 25th and 26th June 2020. The emission rate for the Sludge Tank OCU (STCK1) has been estimated based on information provided and agreed with UU. The report detailing the odour survey emission data is included in **Appendix A**.

4.1.19 As several sources were sampled over two days, to capture any variation in emissions, the mean odour emission rates for these sources have been used in the assessment, at the request of UU.

4.1.20 The emission rate taken from the odour sampling for the Tanker Loading point was given in OU_E/s. The value obtained (27638 OU_E/s) is less than the 'low' emission rate for disturbed sludge given in UKWIR guidance (140 $OU_E/m_2/s$). Therefore, as the Tanker Loading Point has been modelled as an area source (due to lack of available information relating to volume flow rate of emissions), this UKWIR guidance value has been used in the assessment.

4.1.21 It has been confirmed by UU that all the above sources, apart from the Tanker Loading emissions, are operational 24-hours a day for 365 days a year, and that these emission rates should be assumed to be constant.

4.1.22 The Tanker Loading Point (CAREA3) emissions have been modelled using time variable emissions in order to reflect the frequency and duration the tankers are on site each week whilst emptying the sludge tanks. It has been confirmed by UU that this occurs four times every day, Monday to Friday, for half an hour per visit. This gives a total of two hours emissions five days a week.

4.1.23 The Storm Tanks (PAREA4 – PAREA8) are likely to be used only during heavy storm events, usually during the winter months, when increased rainfall increases the flow of water into the WwTW, thereby diluting odour rates within this source. Sampling was undertaken when one of the storm tanks was approximately 75% full of odorous, moist sludge and the other four tanks were empty (this was confirmed by the odour sampling team on site).

4.1.24 UU have stated that they do not usually request storm tanks to be modelled as part of an odour assessment such as this, however UU have requested that all five storm tanks be modelled as if they are 75% full of odorous material in this instance. Therefore, the model has been adjusted to reflect this by modelling the storm tanks at 75% of their actual size, with a constant odour emission rate.

Treatment of Buildings

4.1.25 Building downwash occurs when the aerodynamic turbulence induced by nearby buildings cause a pollutant, emitted from an elevated point source, to be mixed rapidly toward the ground (downwash), resulting in higher ground-level concentrations.

4.1.26 If buildings are present within a distance of 5 times the height of the point source stack, they can be modelled in AERMOD to assess the impact of building downwash on the odour/pollutant concentrations.

4.1.27 As all the odour sources identified in Table 2 are area sources, and there are no elevated point sources at Clitheroe WwTW, the effects of building downwash cannot be included within the AERMOD model. Buildings have not therefore been included within the assessment.

Modelling Uncertainties

4.1.28 The odour assessment has adopted a conservative approach to try to address the uncertainties involved with dispersion modelling.

4.1.29 In line with advice from UU, the assessment has assumed that the emission rates for the various sources will be constant throughout the year apart from the tanker loading emissions, which have been modelled using variable emissions to reflect real world

conditions.

4.1.30 Emission rates have all been agreed with UU and have been drawn directly from an odour sampling survey undertaken at Clitheroe WwTW during June 2020 so as to minimise any uncertainties associated with the emission rate data. UU have confirmed that no changes have taken place at the WwTW since the sampling was undertaken. The emission rate for the Sludge Tank OCU (STCK1) has been estimated based on information provided by and agreed with UU.

4.1.31 In order to address uncertainties within the meteorological data, the model has included five years' worth of NWP meteorological data, in accordance with the EA H4 odour guidance. NWP data allows for the use of predicted modelled meteorological conditions at the proposed development site within the AERMOD model, as opposed to meteorological data from a less representative met station. Whilst still not fully representative of conditions at the proposed development site, this provides a much more robust set of met data in the model. Each individual year of met data has been run separately, and the highest results presented.

4.1.32 Terrain data has been included in .xyz format in order to address uncertainties relating to the dispersion of odour in the vicinity of the WwTW and proposed development.

4.1.33 Details of a potential mitigation measure that could be implemented at Clitheroe WwTW, to reduce the overall odour emissions emitted from the works, has been provided by UU. The mitigation measure proposed involves a two stage OCU attached to the covered sludge tanks, whereby odorous air is treated with a Bio-trickling Filter (BFT) followed by activated carbon treatment.

4.1.34 The odour modelling undertaken has included a carbon filter OCU attached to the covered sludge tanks. Two stage odour control, such as that proposed by UU, has not been modelled. However, it is considered likely that the two-stage treatment process would result in further reduced emission rates from the sludge tank OCU than those included within the assessment.

4.1.35 As a result of these conservative inputs, it is considered the model is more likely to provide an overestimation of the potential odour effects of the WwTW than an underestimation.

4.1.36 Given the nature of the odour source, a level of $C_{98,\ 1\text{-hour}}$ $3ou_E/m^3$ has been adopted for the assessment (98th percentile of 1-hour mean concentration). This criterion

applies at the site boundary but has been assessed across a receptor grid which covers the proposed development site.

5 BASELINE CONDITIONS

5.1 Baseline Odour Conditions

5.1.1 The proposed development site is located in a rural area to the south of the town of Clitheroe. The Clitheroe WwTW will contribute to the background odour conditions; however, agricultural land surrounds the site in most directions, which may also contribute to the background odour conditions.

5.1.2 During all the site visits to the proposed development site, agricultural odours were detected at several monitoring locations within the proposed development site.

5.1.3 The Clitheroe Household Waste Recycling Centre is located approximately 325m to the south west of the development and has the potential to contribute to the background odour conditions in the local area. However, no odour from the centre was detected during any of the site visits which suggests it is not likely to cause any odour impact within the proposed development site.

5.1.4 There is also a small leachate treatment facility, not associated with the Clitheroe WwTW, located adjacent to the west of the WwTW. This has the potential to contribute to the background odour conditions in the local area. However, no odour from this facility was detected during any of the site visits which suggests it is not likely to cause any odour impact within the proposed development site.

5.1.5 RVBC have confirmed they have no existing record of any odour complaints relating to Clitheroe WwTW, current or historic.

6 SITE VISITS

6.1 Site Visits

6.1.1 As part of the previous odour assessment undertaken by Wardell Armstrong (REF: GM10325/004A/Final), six site visits were undertaken between September 2019 and June 2020 to capture variable emissions from the WwTW during different seasons.

6.1.2 All site visits were undertaken in accordance with BS EN 13725. A copy of the odour acuity certificate for the consultant undertaking the site visits is provided in **Appendix D**.

6.1.3 Monitoring locations were selected within the proposed development site at various downwind, upwind and set back distances from the WwTW.

6.1.4 The site visits were selected in order to achieve 'worst case' wind conditions for odour generation, taking into account lower wind speeds, i.e. <5 m/s, downwind conditions wherever possible. However, in accordance with the IAQM guidance, some observations were also undertaken during more 'typical' conditions and at upwind locations in order to gain a more representative data set.

6.1.5 A total of 28 monitoring locations within the proposed site were chosen before the site visits. These locations were chosen in order to provide the best coverage of the site as a whole and are considered to be representative of potential sensitive receptor locations.

6.1.6 It should be noted that the site as a whole is assessed for odour on each site visit, and any odour detected outside of the pre-determined locations is recorded accordingly.

6.1.7 The sniff tests involved normal breathing over a 5-minute period at each monitoring location, with records made of intensity in accordance with the VDI 3940 scale, in accordance with IAQM guidance.

6.1.8 The full set of site odour observation notes and odour impact effect calculations are detailed in the previous qualitative assessment report undertaken by Wardell Armstrong (REF: GM10325/004) and are included in **Appendix C.** A summary of the site visits is included below.

6.2 Summary of Site Visits

6.2.1 Six site visits were undertaken in total between September 2019 and June 2020. All site visits were undertaken at various downwind and upwind locations in relation to the WwTW with various downwind, upwind and set back distances from the WwTW.

6.2.2 During Site Visit 1, 4 monitoring locations (1 -4) were not accessible due the presence of animals in the field. A total of 24 observation periods were conducted, with odour detected at eight of these (33.33%). Odour from Clitheroe WwTW was detected at three locations (12.50%), with the remaining odour relating to agricultural/animal odours.

6.2.3 In accordance with IAQM guidance, odour effects at all 24 monitoring locations were calculated to be negligible.

6.2.4 During Site Visit 2, a total of 28 observation periods were conducted, with odour detected at eight of these (28.57%). Three of these occurrences originated from Clitheroe WwTW (10.71%), with the remaining detected odour relating to agricultural/animal odours.

6.2.5 In accordance with IAQM guidance, odour effects at all 28 monitoring locations were calculated to be negligible.

6.2.6 During Site Visit 3, a total of 28 observation periods were conducted, with odour detected at five of these (17.86%). Odour from Clitheroe WwTW was detected at two locations (7.14%), with the remaining odour relating to agricultural/animal odours.

6.2.7 In accordance with IAQM guidance, odour effects at all 28 monitoring locations were calculated to be negligible.

6.2.8 During site visit 4, a total of 28 observation periods were conducted, with odour detected at twenty of these (71.43%). Odour from Clitheroe WwTW was detected at four locations (14.29%), with the remaining odour relating to agricultural/animal odours.

6.2.9 In accordance with IAQM guidance, odour effects at all 28 monitoring locations were calculated to be negligible.

6.2.10 During site visit 5, a total of 28 observation periods were conducted, with odour detected at three of these (10.71%). Odour from Clitheroe WwTW was detected at one location (3.57%), with the remaining odour relating to agricultural/animal odours.

6.2.11 In accordance with IAQM guidance, odour effects at all 28 monitoring locations were calculated to be negligible.

6.2.12 During site visit 6, a total of 28 observation periods were conducted, with odour detected at eight of these (28.57%). Odour from Clitheroe WwTW was detected at

five locations (17.86%), with the remaining odour relating to agricultural/animal odours.

6.2.13 In accordance with IAQM guidance, odour effects at all 28 monitoring locations were calculated to be negligible.

6.2.14 Combining the six visits, maximum odour intensities recorded at all monitoring locations ranged from 0 'no odour' to 3 'distinct' with a corresponding average odour intensity ranging from 0 'not perceptible' to 1 'slight/very weak', in accordance with IAQM guidance.

6.2.15 Overall, a total of 164 observation periods were conducted. No odour was detected at 112 of these (68.29%).

6.2.16 Of the 52 observation periods that experienced odour, thirty-four related to odour from the surrounding agricultural fields (65.38%).

6.2.17 The remaining 18 locations detected odour from Clitheroe WwTW (34.62%). All these monitoring locations were situated in the south/south eastern area of the proposed development site, in closest proximity to Clitheroe WwTW.

6.2.18 Odour effects at all 164 monitoring locations, including all odour detected from Clitheroe WwTW were calculated as **negligible**.

6.2.19 It is considered that the results of the odour observations during 2019 are still valid for the current assessment, as UU have confirmed that no operational changes or upgrades have taken place at the WwTW since the visits were undertaken. It is considered very likely that similar results would be obtained were the visits to be undertaken again.

7 PREDICTED EFFECTS AND THEIR SIGNIFICANCE

7.1 Odour Dispersion Modelling Results

7.1.1 Odour concentrations, as a result of the operation of Clitheroe WwTW, have been modelled across a receptor grid which covers the proposed development site and surrounding area (see Table 2). Concentrations have been predicted for each of the last five years of available NWP meteorological data (i.e. 2020 to 2024).

7.1.2 Modelling odour concentrations across a receptor grid allows odour contour plots to be produced, which show the extent of the area across which the benchmark level of $C_{98,\ 1\text{-hour}}\ 3ou_E/m^3$ is exceeded. These plots, which have been created for each year of meteorological data considered in the assessment, are included in **Appendix E**.

7.1.3 As the proposed development is for residential use, the assessment should consider the $C_{98,\ 1\text{-hour}}\ 3ou_E/m^3$ as the benchmark criteria. Any area of site predicted to experience odour concentrations above this criterion would not usually be considered suitable for residential development.

7.1.4 The development is split across two sites to the east and west of Henthorn Road. The results of the current mitigation assessment show that in all of the years assessed (2020 to 2024), small areas of the eastern side of the development site are predicted to be affected by the $C_{98,\ 1\text{-hour}}\ 1.5ou_E/m^3$ odour contour only. It should be noted that, in accordance with guidance, residential development is considered suitable within this contour.

7.1.5 The $C_{98,\ 1\text{-hour}}\ 3ou_E/m^3$ odour contour does not reach the proposed development site in any of the five years assessed, as shown on Drawing GM13351-007.

7.1.6 The whole of the western development site is not predicted to be affected by any odour contour in all years considered in the assessment.

7.2 Odour Observation Results

7.2.1 Odour observations were undertaken on six separate site visits between September 2019 and June 2020.

7.2.2 The site visits were undertaken across several different months and seasons, all in suitable meteorological conditions which were conducive to optimum odour generation and dispersion from Clitheroe WwTW, as explained in Section 6 of this report.

7.2.3 In total, 28 monitoring locations were chosen within the proposed development site,

the locations are shown on Drawing GM13551-008.

7.2.4 A total of 164 observation periods were conducted over the six site visits. No odour was detected at 112 of these (68.29%). Of the 52 observation periods that experienced odour, thirty-four of these related to odour from the surrounding agricultural fields.

7.2.5 The remaining 18 locations detected odour from Clitheroe WwTW. They were located in the south/south eastern area of the eastern development site, closest to Clitheroe WwTW.

7.2.6 Odour effects at all 164 monitoring locations, including all odour detected from Clitheroe WwTW, were calculated to be negligible.

7.2.7 In accordance with IAQM guidance, based on the odour observations undertaken across the six site visits between September 2019 and June 2020, the odour effects of Clitheroe WwTW on the proposed development site as a whole, correlate to a **'not significant'** overall odour impact.

7.3 Odour Complaint History

7.3.1 It has been confirmed by Ms Nicola Clark and Ms Michaela Gleave, Environmental Health Officers at RVBC, that no complaints relating to Clitheroe WwTW have been received by the Council.

7.4 Discussion of Results

7.4.1 IAQM guidance states that considerable weight should be given to those assessment tools based on real world observations, such as odour observation site visits and odour complaint histories.

7.4.2 The current modelling assessment has incorporated a potential odour mitigation measure at the Clitheroe WwTW – the covering of the sludge tanks which would send all odorous air to a carbon filter OCU for treatment before release to the atmosphere. This mitigation measure would be paid for by the developer.

7.4.3 Steps have been taken during the modelling process to improve the perceived reliability of the model, as outlined in Section 4 of this report. These steps are also summarised below:

- A further three odour observation site visits were undertaken within the proposed development site, additional to the minimum of three visits recommended in the IAQM guidance, in order to build a bigger, more robust picture of actual odour conditions on site.

- Instead of using library value odour emission rates within the assessment, odour sampling was undertaken at Clitheroe WwTW to obtain representative odour emission rates of the sources included in the model.
- There is no representative meteorological station in close proximity to the proposed development site. Therefore, to obtain more representative meteorological data for use within the assessment, Numerical Weather Prediction models were obtained from the ADM Ltd.
- The NWP data used within the assessment has been processed using AERMET software. The predominant characteristics of land use in an area provide a measure of the vertical mixing and dilution that is likely to take place in the atmosphere due to factors such as surface roughness and albedo. Examination of the local setting shows that site is semi-rural, with semi urban land uses to the north and north east, with more open, cultivated land to the east west and south. There is woodland to the north and west of Clitheroe WwTW, approximately 85m and 45m deep respectively. The meteorological data has been processed using AERMET, taking into account these land uses.
- The proposed development site lies in a valley and, as such, is surrounded by complex terrain. In order to improve accuracy, detailed terrain data has been included in the model.

7.4.4 The above steps led to an increase in the perceived reliability of the model and the results can be considered to be much more representative than if these steps had not been taken.

7.4.5 When reaching an overall conclusion on the significance of likely odour effects, the IAQM guidance states that the findings of the different odour assessment tools should be drawn together. This includes community-based tools, such as odour complaint histories, and empirical tools, such as sniff tests. The guidance states that both of these should normally be given *"considerable weight"* when drawing conclusions in an assessment.

7.4.6 The results of the mitigation modelling assessment show that in all years considered as part of the assessment (2020-2024), small areas of the eastern side of the development site are predicted to be affected by the $C_{98,\ 1\text{-hour}}$ 1.5ouE/m3 odour contour only. It should be noted that, in accordance with guidance, residential development is considered suitable within this contour.

7.4.7 The $C_{98,\ 1\text{-hour}}$ 3ouE/m3 odour contour does not reach the proposed development site in any of the five years assessed, as shown on Drawing GM13351-007.

7.4.8 The whole of the western development site is not predicted to be affected by any odour contour in all years considered in the assessment.

7.4.9 Therefore, following the implementation of the proposed mitigation measure suggested by UU, the modelling assessment predicts that the whole of the proposed development site will be suitable for residential development.

7.4.10 However, it is understood that the framework plan for the proposed development incorporates a setback distance from Clitheroe WwTW, with no residential development proposed in the south eastern-most area of the proposed development site. The framework plan for the proposed development site is included in **Appendix F.**

7.4.11 The results of the six odour observation site visits, undertaken across a ten-month period between September 2019 and June 2020, show very little detectable odour from the Clitheroe WwTW within the proposed development site, based on current operations at the WwTW.

7.4.12 Out of a total of 164 odour observations undertaken within the proposed development during these visits, only 18 of these detected odours from Ciltheroe WwTW (10.98%).

7.4.13 The majority of these observations of odour were located in the south/south eastern area of the proposed development site, in closest proximity to Clitheroe WwTW.

7.4.14 All predicted odour impacts from Ciltheroe WwTW, based on the observations, were calculated to be negligible. These results are considered likely to improve further following the implementation of the proposed mitigation measures at the WwTW.

7.4.15 Combining the results of the assessment together, the effect of odour from Clitheroe WwTW on the proposed development site is as a result of the implementation of the proposed mitigation measure, is considered to be negligible, which correlates to an overall **'not significant'** effect, in accordance with IAQM guidance.

8 CONCLUSIONS

8.1 Odour Dispersion Modelling

8.1.1 Odour dispersion modelling has been undertaken using AERMOD to consider the potential for odour effects from Clitheroe WwTW at the proposed development site, following the implementation of the proposed mitigation measures at the WwTW.

8.1.2 Steps were taken to increase the perceived reliability of the model in an attempt to ensure the results of the model are as representative of actual conditions as possible, as discussed in Section 4 and 7.4 of this report.

8.1.3 Odour concentrations have been predicted across a receptor grid, which incorporates the entire proposed development site and surrounding area. This has allowed odour contour plots to be created for each of the five years of meteorological data considered. The predicted odour concentrations have been compared against a benchmark level of $C_{98,\ 1\text{-hour}}\ 3ou_E/m^3$.

8.1.4 The results of the of the mitigation assessment show that in all of the years assessed (2020 to 2024), small areas of the eastern side of the development site are predicted to be affected by the $C_{98,\ 1\text{-hour}}\ 1.5ou_E/m^3$ odour contour only. It should be noted that, in accordance with guidance, residential development is considered suitable within this contour.

8.1.5 The $C_{98,\ 1\text{-hour}}\ 3ou_E/m^3$ odour contour does not reach the proposed development site in any of the five years assessed.

8.1.6 The whole of the western development site is not predicted to be affected by any odour contour in all years considered in the assessment.

8.2 Odour Observations

8.2.1 Odour observations were undertaken on six separate day site visits between September 2019 and June 2020.

8.2.2 The results of the six odour observation site visits, undertaken across a tenth month period between September 2019 and June 2020, show very little detectable odour from the Clitheroe WwTW within the proposed development site.

8.2.3 Out of a total of 164 odour observations undertaken within the proposed development during these visits, only 18 of these detected odours originating from Ciltheroe WwTW (10.98%). The majority of the observations were located in the south/south eastern area of the proposed development site, closest to Clitheroe

WwTW.

8.2.4 All predicted odour impacts from Ciltheroe WwTW, based on the results of the monitoring, were calculated to be negligible.

8.2.5 In accordance with IAQM guidance, based on the results of the odour observation site visits, the effects of Clitheroe WwTW on the proposed development site as a whole, correlate to a **'not significant'** overall odour impact.

Odour Complaint History

8.2.6 RVBC have confirmed there are no existing or previous odour complaints relating to Clitheroe WwTW.

8.3 Summary

8.3.1 The extensive odour observations within the proposed development site detected very little odour from the WwTW. There is also a lack of odour complaints relating to the WwTW. Odour dispersion modelling was also undertaken for the WwTW.

8.3.2 The results of the mitigation modelling predict that no area within the whole of the proposed development site will be impacted by the $C_{98,\ 1\text{-hour}}$ $3ou_E/m^3$ odour benchmark criteria contour, and therefore the whole of the development site is considered suitable for residential uses.

8.3.3 The framework plan for the proposed development, included in **Appendix F**, incorporates a setback distance from Clitheroe WwTW, with no residential development proposed in the south eastern-most area of the proposed development site. This correlates well with the results of the odour observation site visits, where odour from Clitheroe WwTW was detected sporadically in this area. It should be noted that all odour effects in this area, and within the development site as a whole, were calculated to be negligible.

8.3.4 Taking the results of the mitigation modelling assessment, together with the odour observation results and odour complaint history, it is considered that the effects of odour from Clitheroe WwTW on the proposed development site, following the implementation of the proposed mitigation measure, is negligible, which correlates to an overall **'not significant'** effect. Odour is therefore not considered to be a constraining factor is granting residential planning permission for the site.

APPENDICES

Appendix A:
Olfasense Odour Sampling Report

REPORT

Odour survey at Clitheroe wastewater treatment works

Client:

Wardell Armstrong

Report Number:

WARA20A_04_final

Project Code:

WARA20A

title:	Odour survey at Clitheroe wastewater treatment works
report number:	WARA20A_04_final
project code:	WARA20A
key words:	
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1 Introduction and Scope

Olfasense UK Ltd were commissioned by Wardell Armstrong (WA) to undertake an odour sampling exercise at Clitheroe Waterwater Treatment Works (WwTW) in Lancashire. This report presents the results of the odour survey.

1.1 Scope

The scope of the study as defined by the client was as follows:

- To undertake an odour survey of the WwTW to measure the odour emission rates from 9 No. key elements of the sewage treatment process.
- To define emission estimates for each odorous element of the process under the existing operational conditions.

1.2 Structure of report

The structure of the report is as follows:

- Section 2 presents the approach adopted.
- Section 3 presents the results of the survey.

Supporting information can be found in the Annexes.

1.3 Quality Control and Assurance

Olfasense's odour measurement, assessment and consultancy services are conducted to the highest possible quality criteria by highly trained and experienced specialist staff. All activities are conducted in accordance with quality management procedures that are certified to ISO 9001 (Certificate No. A13725).

All sensory odour analysis and odour sampling services are undertaken using UKAS accredited procedures (UKAS Testing Laboratory No. 2430) which comply fully with the requirements of the international quality standard ISO 17025:2017[1] and the European standard for olfactometry BS EN 13725:2003[2]. Where required, Olfasense are accredited to conduct odour sampling from stacks and ducts in accordance to ISO 17025:2017 and BS EN 13725:2003 under the MCERTS scheme. Olfasense is the only company in the UK to have secured UKAS accreditation for all elements of the odour measurement and analysis procedure. Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

The Olfasense laboratory is recognised as one of the foremost laboratories in Europe, consistently out performing the requirements of the British Standard for Olfactometry in terms of accuracy and repeatability of analysis results.

[1] ISO 17025:2017 – *General requirements for the competence of testing and calibration laboratories.*

[2] BS EN 13725:2003 – *Air quality. Determination of odour concentration by dynamic olfactometry.*

2 Description of approach

The following approach was adopted for the 2 day sampling exercise at Clitheroe WwTW:

1. The odour sampling was conducted using Olfasense's UKAS accredited source sampling procedures (UKAS Laboratory Number 2430). The odour survey involved the collection of odour samples from the sources outlined in the table below using techniques that comply with the British Standard for olfactometry BS EN 13725.

Table 1: Scope of measurement survey outlined by WA

Location no.	Sampling location	Sampling technique	No. of odour samples	
			Day 1	Day 2
1	Detritor AM	Hood	2	2
2	Detritor PM	Hood	2	2
3	Primary settlement tanks	Hood	3	3
4	ASP – anoxic zone	Hood	3	-
5	ASP – First aerated zone	Hood	3	-
6	ASP – Final aerated zone	Hood	3	-
7	Raw sludge storage / consolidation tank	Hood	3	3
8	Storm detention tank (Stormwater)	Hood	3	-
9	Tanker loading vent	Point / volume	3	3

2. Sampling was conducted across 2 No. separate days. Where possible, samples were collected at differing times of day.

3. The collected odour samples were transported back to the Olfasense UK Ltd UKAS accredited testing laboratory (number 2430) in Bristol for the following analysis:

   - Olfactometry analysis to determination the total odour concentration in terms of European odour units (ou_E/m^3) in accordance with the British Standard BS EN 13725.

4. The analysis results were used to calculate the odour emission rate of each area source sampled in $ou_E/m^2/s$. Results for the tanker loading vent were presented in ou_E/m^3

3 Results

3.1 Odour survey

The geometric mean odour concentration, expressed in European odour units, and odour emission rates for the locations sampled are presented in Table 2 below. The results are presented in full in Annex B.

Table 2: Odour concentration and emission rates

Sample location	Description	Result	Odour emission rate ($ou_E/m^2/s$)	
			Day 1 Geomean	Day 2 Geomean
1	Detritor AM	Emission rate ($ou_E/m^2/s$)	1.3	5.1
		Odour concentration (ou_E/m^3)	169	753
2	Detritor PM	Emission rate ($ou_E/m^2/s$)	2.1	14.3
		Odour concentration (ou_E/m^3)	317	2,027
3	Primary settlement tanks	Emission rate ($ou_E/m^2/s$)	1.4	8.1
		Odour concentration (ou_E/m^3)	194	1060
4	ASP – anoxic zone	Emission rate ($ou_E/m^2/s$)	4.1	-
		Odour concentration (ou_E/m^3)	511	-
5	ASP – First aerated zone – AM/PM	Emission rate ($ou_E/m^2/s$)	2.7	-
		Odour concentration (ou_E/m^3)	405	-
	ASP – First aerated zone – PM	Emission rate ($ou_E/m^2/s$)	2.7	-
		Odour concentration (ou_E/m^3)	351	-
6	ASP – Final aerated zone – AM	Emission rate ($ou_E/m^2/s$)	0.8	-
		Odour concentration (ou_E/m^3)	100	-
	ASP – Final aerated zone – PM	Emission rate ($ou_E/m^2/s$)	0.5	-
		Odour concentration (ou_E/m^3)	76	-
7	Raw sludge storage / consolidation tank	Emission rate ($ou_E/m^2/s$)	184.7	95.9
		Odour concentration (ou_E/m^3)	11,610	6,798
8	Storm detention tank (Stormwater)**	Emission rate ($ou_E/m^2/s$)	3.1	-
		Odour concentration (ou_E/m^3)	404	-
9	Tanker loading vent	Odour concentration (ou_E/m^3)	195,828	1,220,759

(-) Denotes no sample collected

The following points were of note during the odour survey:

- Due to tanker schedules 4 no. samples were collected on day two and 2 no. samples were collected on day one.
- 4 No. of the 5 No. storm tanks were empty and so samples were taken from the one tank which contained material.
- The inlet channels pre-screens were too narrow to sample, even with a half-sized Lindvall hood. The same was the case for the channels downstream of the screens. On agreement

with Paul Kynaston of United Utilities the detritor was sampled AM and PM in place of these.

Annex A – Sampling & Analysis Techniques

A.1 Collection of odour samples from sources with no measurable flow

Collection of samples from area sources where there is no measurable flow such as open liquid tanks or channels and piles of sludge cake was conducted using a ventilated canopy known as a 'Lindvall hood'. The canopy was placed on the odorous material and ventilated at a known rate with clean odourless air. A sample of odour was collected from the outlet port of the hood using the 'Lung' principle.

The rate of air blown into the hood was monitored for each sample and used to calculate a specific odour emission rate per unit area per second (E_{sp}) as follows:

- Odour emission rates for sources where a Lindvall sampling hood was used were calculated in odour units per square metre per second ($ou_E/m^2/s$) using the following equation:

$$E_{sp}\,(ou_E/m^2/s) = C_{hood} \times L \times V$$

Where:

C_{hood} is the concentration result from the laboratory analysis.

V is the flow presented to the hood.

L is the $\frac{\text{flow path cross section of the hood } (m^2)}{\text{Covered area } (m^2)}$

- Odour emission rates for sources where a sampling sheet was used were calculated in odour units per square metre per second ($ou_E/m^2/s$) by multiplying the geometric mean odour concentration of the samples (from the laboratory analysis) by the air volume flow rate of air from the fan presented under the sheet, and dividing this figure by the area of the sheeted section of material.

A.2 Measurement of odour concentration using olfactometry

Odour measurement is aimed at characterising environmental odours, relevant to human beings. As no methods exist at present that simulates and predict the responses of our sense of smell satisfactorily, the human nose is the most suitable 'sensor'. Objective methods have been developed to establish odour concentration, using human assessors. A British standard applies to odour concentration measurement:

- BS EN 13725:2003, *Air quality - Determination of odour concentration by dynamic olfactometry.*

The odour concentration of a gaseous sample of odorants is determined by presenting a panel of selected and screened human subjects with that sample, in varying dilutions with neutral gas, in order to determine the dilution factor at the 50% detection threshold (D_{50}). The odour concentration of the examined sample is then expressed as multiples of one European Odour Unit per cubic meter [ou_E/m^{-3}] at standard conditions.

Annex B – Full survey results

Table 3: Odour survey results – area sources

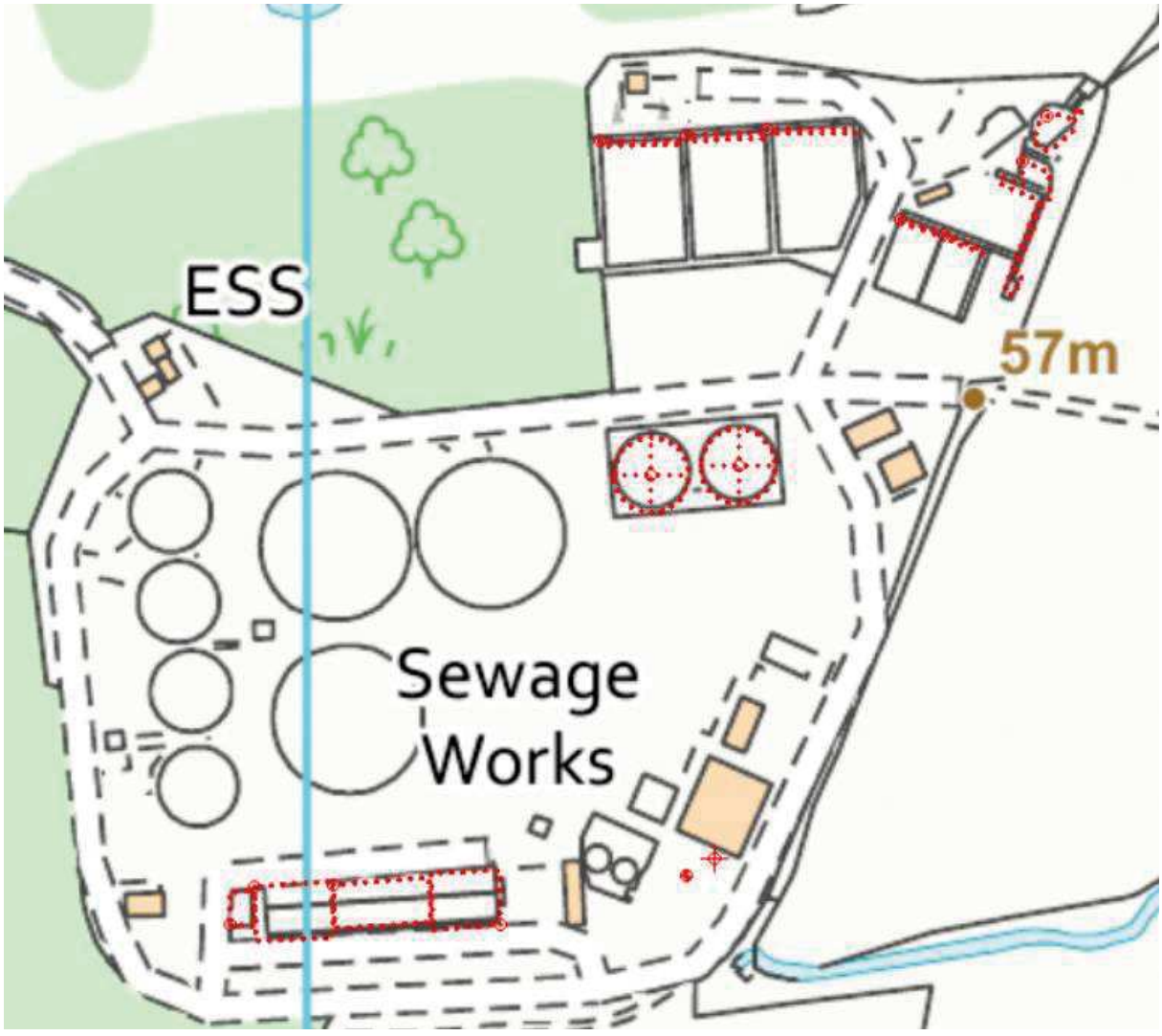
Sample location	Description	Day 1				Day 2			
		Time	Odour emission rate ($ou_E/m^2/s$)			Time	Odour emission rate ($ou_E/m^2/s$)		
			1	2	3		1	2	3
1	Detritor AM	11:15-11:30	1.1	1.6	-	07:50-08:10	8.5	3.1	-
2	Detritor PM	15:25-15:40	1.8	2.3	-	09:50-10:00	20.8	9.8	-
3	Primary settlement tanks	12:55-13:15	1.2	2.0	1.1	08:25-08:40	8.3	8.4	7.5
4	ASP – anoxic zone	09:15-09:40	4.7	4.9	3.0	-	-	-	-
5	ASP – First aerated zone	09:50-10:10 & 14:45	2.3	3.1	2.7	-	-	-	-
6	ASP – Final aerated zone	10:25-10:45 & 14:55	0.9*	0.7*	0.5*	-	-	-	-
7	Raw sludge storage / consolidation tank	13:40-14:05	172.0	160.0	229.1	09:00-09:25	86.7	114.7	88.7
8	Storm detention tank (Stormwater)	11:40-12:00	4.0	3.1	2.3	-	-	-	-

(*) Denotes values that returned an invalid olfactometry result based on correct identification by panellists. Data may be overestimated due to insufficient number of panellists identifying odour.

Table 4: Odour survey results – Tanker

Sample location	Description	Day 1				Day 2			
		Time	Odour concentration (ou_E/m^3)			Time	Odour concentration (ou_E/m^3)		
			1	2	3		1	2	3
9	Tanker loading vent (ou_E/m^3)	12:17 - 12:18	183,566	208,910	-	10:02-10:05	660,498	1,447,062	1,113,270 and 2,087,182

Appendix B
Odour Sources at Clitheroe WwTW


ESS
57m
Sewage
Works

Appendix C
Site Visit Observations

Job Number:	GM10325	**Site:**	Henthorn Road, Clitheroe	**Date:**	20/09/19
Start time:	12:20	**Finish Time:**	14:45	**Surveyor:**	Paul Threlfall
General Weather Conditions:	**Temperature: 23°C** **Cloud Cover: 1/8**		**Wind Direction: SSE/SE/ESE** **Wind Strength: Very light, very often calm conditions**		
Comments (e.g. site operations, weather changes, general info etc): Very warm and sunny. Wind conditions really light, almost still conditions for majority of survey.					

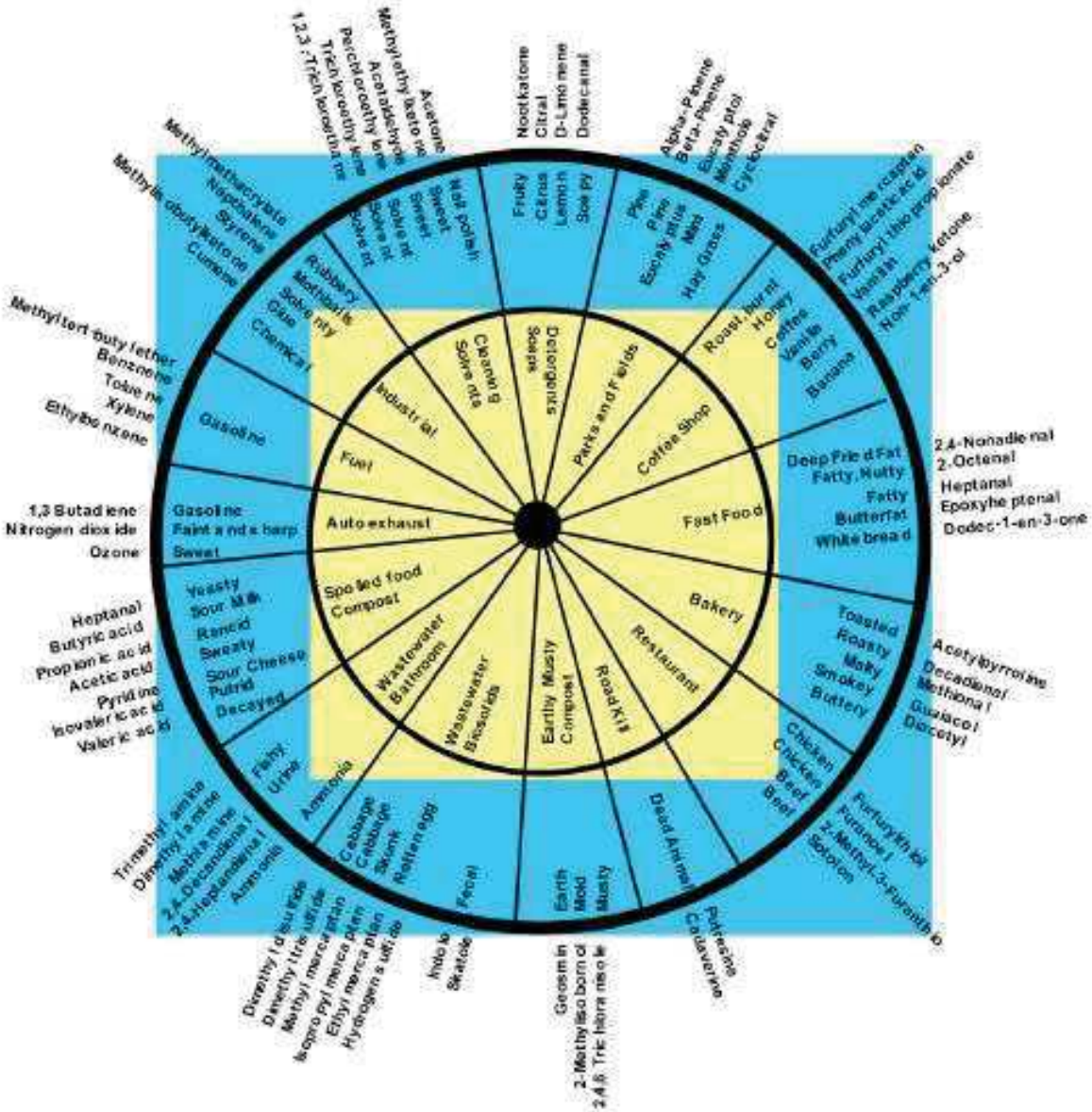
Local Ref. & Description	If first visit – it is useful to stop at site boundary/site entrance to determine the potential odour present. The assessment begins at an upwind location, moving closer to the source and into the downwind location. Record location numbers, mark on map and description of location.
Weather conditions	General description – dry, wet, humid, fog etc.
Temperature	Degrees C (estimate from Met Office or similar) otherwise, very warm, warm, cold, mild etc. Be wary of anemometer readings as they often record the surface temperature on the monitor which, if left in warm car or bag, can give misreading's.
Cloud Cover	Use a scale of 8 where 0 is clear sky and 8 is complete cloud cover. Can convert this number to a percentage.
Wind Strength	Use anemometer as priority, otherwise: Beaufort Scale: 0. Calm (smoke rises vertically) 1. Light Air (direction of wind shown by a smoke drift) 2. Light Breeze (Wind felt on face, leaves rustle) 3. Gentle Breeze (leaves and small twigs in constant movement 4. Moderate Breeze (approx. 5m/s, raises dust and loose paper, small branches move) 5. Fresh Breeze (small tree in leaf begin to sway, small branches move) 6. Strong Breeze (large branches in motion, umbrella used with difficulty) 7. Near Gale (whole trees in motion, inconvenience felt when walking against wind)
Wind Direction	N, NE, NEE etc.
Duration of Test	5 mins minimum. Record any odour detected walking between locations. Note this is standard so does not need to be written in notes.
Intensity	IAQM Guidance 0 to 6. 0. No odour 1. Slight/Very Weak – Potentially odour, may be doubt to whether odour is present 2. Slight/Weak – Odour is present but source/words to describe it are unknown 3. Distinct – Odour character/nature is barely recognisable 4. Strong – Odour character/nature easily recognisable 5. Very Strong – Odour is offensive. Exposure to this level is undesirable 6. Extremely Strong – Odour is offensive. Difficulty staying in locality and instinctive reaction to mitigate against further exposure.
Offensiveness	Use Hedonic Tone score: 1. -4 =extremely unpleasant, 0 = neither unpleasant or pleasant, +4 = extremely pleasant
Nature of Smell	What does it smell like. Use odour wheel where appropriate.
Potential Source	Odour is distinct enough to state a likely source e.g. landfill, sewage treatment works. To be stated when certain of the source (note Intensity 3 is distinct)
Odour Duration	Time 'sniffed' odour for e.g. 30 second 'wave' at intensity 4, 30 Sec @I.4

General Information

Hedonic Score Rating

Very Pleasant	+4
Pleasant	+3
Moderately Pleasant	+2
Mildly Pleasant	+1
Neutral Odour / No Odour	0
Mildly Unpleasant	-1
Moderately Unpleasant	-2
Unpleasant	-3
Very Unpleasant	-4

Odour Wheel



Location Number/ Description	**1**	**2**	**3**	**4**	**5**
Time of 'Sniff Test'	-	-	-	-	1220
Weather conditions	-	-	-	-	Sunny/Warm/Dry
Wind Speed (m/s)/Direction	-	-	-	-	<1m/s, SSE
Upwind/Downwind Location	-	-	-	-	Downwind
Intensity (0 – 6)	-	-	-	-	No Odour
Offensiveness (-4 to +4)	-	-	-	-	-
Nature of odour	-	-	-	-	-
Potential Source	-	-	-	-	-
Odour Duration (seconds) (5 mins = 300 seconds)	-	-	-	-	-
Other comments/Rationale (record as much info as you can to aid write up in office)	Unable to undertake observation due to animals in field at this location	Unable to undertake observation due to animals in field at this location	Unable to undertake observation due to animals in field at this location	Unable to undertake observation due to animals in field at this location	Very calm conditions, wind very light.

Location Number/ Description	**6**	**7**	**8**	**9**	**10**
Time of 'Sniff Test'	1226	1232	1237	1245	1250
Weather conditions	Sunny/Warm/Dry	Sunny/Warm/Dry	Sunny/Warm/Dry	Sunny/Warm/Dry	Sunny/Warm/Dry
Wind Speed (m/s)/Direction	1.2, SSE	<1m/s, SSE	<1m/s, SSE	<1m/s, SSE	1.3, SE
Upwind/Downwind Location	Downwind	Downwind	Downwind	Downwind	Downwind
Intensity (0 – 6)	No Odour	No Odour	1/2	No Odour	No Odour
Offensiveness (-4 to +4)	-	-	-2	-	-
Nature of odour	-	-	Animal waste	-	-
Potential Source	-	-	Animals in surrounding fields	-	-
Odour Duration (seconds) (5 mins = 300 seconds)	-	-	1 – 30 seconds 2 – 50 seconds	-	-
Other comments/Rationale (record as much info as you can to aid write up in office)	-	-		-	-

Location Number/ Description	**11**	**12**	**13**	**14**	**15**
Time of 'Sniff Test'	1257	1305	1310	1312	1317
Weather conditions	Sunny/Warm/Dry	Sunny/Warm/Dry	Sunny/Warm/Dry	Sunny/Warm/Dry	Sunny/Warm/Dry
Wind Speed (m/s)/Direction	<1m/s, SE	1.1, SE	<1m/s, SSE	<1m/s, ESE/SSE	1.3, ESE
Upwind/Downwind Location	Downwind	Downwind	Downwind	Upwind/Downwind	Upwind
Intensity (0 – 6)	No Odour	No Odour	2	2	No Odour
Offensiveness (-4 to +4)	-	-	-2	-2	-
Nature of odour	-	-	Animal waste	Animal waste	-
Potential Source	-	-	Animals in surrounding fields	Animals in surrounding fields	-
Odour Duration (seconds) (5 mins = 300 seconds)	-	-	2 -60 seconds	2 – 60 seconds	-
Other comments/Rationale (record as much info as you can to aid write up in office)	-	-	Often very calm conditions. Location sheltered by trees.		-

Location Number/ Description	**16**	**17**	**18**	**19**	**20**
Time of 'Sniff Test'	1325	1330	1337	1343	1350
Weather conditions	Sunny/Warm/Dry	Sunny/Warm/Dry	Sunny/Warm/Dry	Sunny/Warm/Dry	Sunny/Warm/Dry
Wind Speed (m/s)/Direction	<1m/s, ESE	1.3, SSE	1.5, SSE	1.5, ESE	1.1, SSE/SE
Upwind/Downwind Location	Upwind	Downwind	Downwind	Upwind	Downwind
Intensity (0 – 6)	No Odour	No Odour	2/3	No Odour	No Odour
Offensiveness (-4 to +4)	-	-	-2	-	-
Nature of odour	-	-	Animal waste	-	-
Potential Source	-	-	Animals in surrounding fields	-	-
Odour Duration (seconds) (5 mins = 300 seconds)	-	-	2 -10 seconds 3 – 40 seconds	-	-
Other comments/Rationale (record as much info as you can to aid write up in office)	-	-	Definitely not an WWTW odour. Often calm conditions.	-	-

Location Number/ Description	**21**	**22**	**23**	**24**	**25**
Time of 'Sniff Test'	1355	1401	1407	1415	1420
Weather conditions	Sunny/Warm/Dry	Sunny/Warm/Dry	Sunny/Warm/Dry	Sunny/Warm/Dry	Sunny/Warm/Dry
Wind Speed (m/s)/Direction	<1m/s, SSE/SE	1.6, ESE	1.3, SSE	<1m/s, SSE/SE	<1m/s, SSE
Upwind/Downwind Location	Downwind	Upwind	Downwind	Downwind	Downwind
Intensity (0 – 6)	No Odour	No Odour	2/3	No Odour	2/3
Offensiveness (-4 to +4)	-	-	-2	-	-3
Nature of odour	-	-	Sewage (inlet)	-	Sludge/Animal waste
Potential Source	-	-	Clitheroe WWTW	-	Clitheroe WWTW/Surrounding fields
Odour Duration (seconds) (5 mins = 300 seconds)	-	-	2 – 30 seconds 3 – 20 seconds	-	Sludge 2 – 30 seconds 3 – 40 seconds Animal 3 – 90 seconds
Other comments/Rationale (record as much info as you can to aid write up in office)	-	-	-	-	Very often calm conditions. Animal odour more prevalent during calmer conditions.

Location Number/ Description	**26**	**27**	**28**		
Time of 'Sniff Test'	1425	1431	1436		
Weather conditions	Sunny/Warm/Dry	Sunny/Warm/Dry	Sunny/Warm/Dry		
Wind Speed (m/s)/Direction	1.6, SSE	<1m/s, SSE	1.4, SSE		
Upwind/Downwind Location	Downwind	Upwind	Downwind		
Intensity (0 – 6)	1	No Odour	2/3		
Offensiveness (-4 to +4)	-3	-	-3		
Nature of odour	Sewage (sludge)	-	Animal waste		
Potential Source	Clitheroe WWTW	-	Animals in surrounding fields		
Odour Duration (seconds) (5 mins = 300 seconds)	1 – 10 seconds	-	2 – 20 seconds 3 – 10 seconds		
Other comments/Rationale (record as much info as you can to aid write up in office)	Nearly 100% calm conditions. Odour very faint and infrequent.	Nearly 100% calm conditions.	-		

Job Number:	GM10325	**Site:**	Henthorn Road, Clitheroe	**Date:**	23/09/19
Start time:	13:05	**Finish Time:**	15:55	**Surveyor:**	Paul Threlfall
General Weather Conditions:	**Temperature: 18-19°C** **Cloud Cover: 7/8 – 5/8**		**Wind Direction: SSE/SE** **Wind Strength: Light, often calm conditions**		

Comments (e.g. site operations, weather changes, general info etc): Clouds broke during observations to become sunnier and warmer.

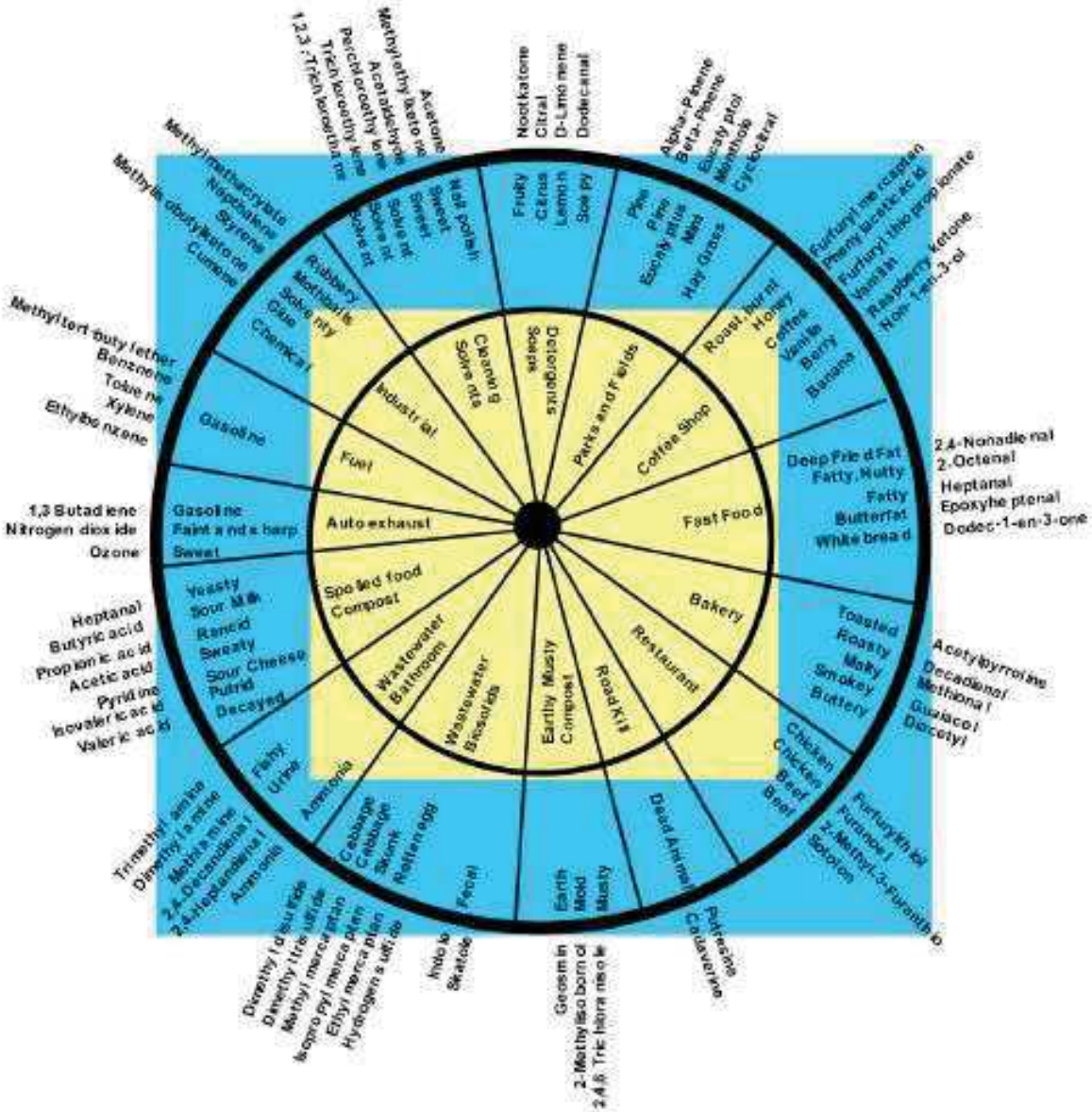
Local Ref. & Description	If first visit – it is useful to stop at site boundary/site entrance to determine the potential odour present. The assessment begins at an upwind location, moving closer to the source and into the downwind location. Record location numbers, mark on map and description of location.
Weather conditions	General description – dry, wet, humid, fog etc.
Temperature	Degrees C (estimate from Met Office or similar) otherwise, very warm, warm, cold, mild etc. Be wary of anemometer readings as they often record the surface temperature on the monitor which, if left in warm car or bag, can give misreading's.
Cloud Cover	Use a scale of 8 where 0 is clear sky and 8 is complete cloud cover. Can convert this number to a percentage.
Wind Strength	Use anemometer as priority, otherwise: Beaufort Scale: 8. Calm (smoke rises vertically) 9. Light Air (direction of wind shown by a smoke drift) 10. Light Breeze (Wind felt on face, leaves rustle) 11. Gentle Breeze (leaves and small twigs in constant movement 12. Moderate Breeze (approx. 5m/s, raises dust and loose paper, small branches move) 13. Fresh Breeze (small tree in leaf begin to sway, small branches move) 14. Strong Breeze (large branches in motion, umbrella used with difficulty) 15. Near Gale (whole trees in motion, inconvenience felt when walking against wind)
Wind Direction	N, NE, NEE etc.
Duration of Test	5 mins minimum. Record any odour detected walking between locations. Note this is standard so does not need to be written in notes.
Intensity	IAQM Guidance 0 to 6. 7. No odour 8. Slight/Very Weak – Potentially odour, may be doubt to whether odour is present 9. Slight/Weak – Odour is present but source/words to describe it are unknown 10. Distinct – Odour character/nature is barely recognisable 11. Strong – Odour character/nature easily recognisable 12. Very Strong – Odour is offensive. Exposure to this level is undesirable 13. Extremely Strong – Odour is offensive. Difficulty staying in locality and instinctive reaction to mitigate against further exposure.
Offensiveness	Use Hedonic Tone score: 2. -4 =extremely unpleasant, 0 = neither unpleasant or pleasant, +4 = extremely pleasant
Nature of Smell	What does it smell like. Use odour wheel where appropriate.
Potential Source	Odour is distinct enough to state a likely source e.g. landfill, sewage treatment works. To be stated when certain of the source (note Intensity 3 is distinct)
Odour Duration	Time 'sniffed' odour for e.g. 30 second 'wave' at intensity 4, 30 Sec @I.4

General Information

Hedonic Score Rating

Very Pleasant	+4
Pleasant	+3
Moderately Pleasant	+2
Mildly Pleasant	+1
Neutral Odour / No Odour	0
Mildly Unpleasant	-1
Moderately Unpleasant	-2
Unpleasant	-3
Very Unpleasant	-4

Odour Wheel



Location Number/ Description	**1**	**2**	**3**	**4**	**5**
Time of 'Sniff Test'	1305	1310	1316	1321	1327
Weather conditions	Cloudy/Dry	Cloudy/Dry	Cloudy/Dry	Cloudy/Dry	Cloudy/Dry
Wind Speed (m/s)/Direction	<1m/s, SSE	1.5, SSE	1.7, S/SSE	<1m/s, SSE	<1m/s, SSE
Upwind/Downwind Location	Downwind	Downwind	Downwind	Downwind	Downwind
Intensity (0 – 6)	No Odour	No Odour	No Odour	No Odour	No Odour
Offensiveness (-4 to +4)	-	-	-	-	-
Nature of odour	-	-	-	-	-
Potential Source	-	-	-	-	-
Odour Duration (seconds) (5 mins = 300 seconds)	-	-	-	-	-
Other comments/Rationale (record as much info as you can to aid write up in office)	Often calm conditions	Some calm conditions	-	Often calm conditions	-

Location Number/ Description	**6**	**7**	**8**	**9**	**10**
Time of 'Sniff Test'	1340	1345	1350	1400	1405
Weather conditions	Cloudy/Dry	Cloudy/Dry	Cloudy/Dry	Cloudy/Dry	Cloudy/Dry
Wind Speed (m/s)/Direction	1.3, SSE	1.4, SSE	1.2, SSE	1.3, S/SSE	2.3, SSE
Upwind/Downwind Location	Downwind	Downwind	Downwind	Downwind	Downwind
Intensity (0 – 6)	No Odour	1	1/2	No Odour	No Odour
Offensiveness (-4 to +4)	-	-1	-1	-	-
Nature of odour	-	Animal/Animal waste	Animal/Animal waste	-	-
Potential Source	-	Animals in surrounding fields	Animals in surrounding fields	-	-
Odour Duration (seconds) (5 mins = 300 seconds)	-	1 – 30 seconds	1 – 20 seconds 2 – 40 seconds	-	-
Other comments/Rationale (record as much info as you can to aid write up in office)	-	-		-	-

Location Number/ Description	**11**	**12**	**13**	**14**	**15**
Time of 'Sniff Test'	1411	1417	1425	1430	1436
Weather conditions	Cloudy/Dry	Cloudy/Dry	Cloudy/Dry	Cloudy/Dry	Cloudy/Dry
Wind Speed (m/s)/Direction	2.3, SSE	2.7, SSE	3.1, S/SSE	2.3, SSE	2.1, SSE
Upwind/Downwind Location	Downwind	Downwind	Downwind	Downwind	Downwind
Intensity (0 – 6)	No Odour	2	1/2	No Odour	No Odour
Offensiveness (-4 to +4)	-	-2	-2	-	-
Nature of odour	-	Animal/Animal waste	Animal/Animal waste	-	-
Potential Source	-	Animals in surrounding fields	Animals in surrounding fields	-	-
Odour Duration (seconds) (5 mins = 300 seconds)	-	2 – 50 seconds	1 – 10 seconds 2 -30 seconds	-	-
Other comments/Rationale (record as much info as you can to aid write up in office)	-	-	Location sheltered by trees.	-	-

Location Number/ Description	**16**	**17**	**18**	**19**	**20**
Time of 'Sniff Test'	1442	1447	1452	1458	1505
Weather conditions	Partly sunny/Dry	Partly sunny/Dry	Partly sunny/Dry	Partly sunny/Dry	Partly sunny/Dry
Wind Speed (m/s)/Direction	1.5, SSE	2.1, S/SSE	3.0, SSE	2.2, SSE/S	2.7, S/SSE
Upwind/Downwind Location	Downwind	Downwind	Downwind	Downwind	Downwind
Intensity (0 – 6)	No Odour	No Odour	No Odour	No Odour	1/2
Offensiveness (-4 to +4)	-	-	-	-	-2
Nature of odour	-	-	-	-	Sewage (faecal/sludge)/Animal
Potential Source	-	-	-	-	Clitheroe WWTW/Animals in surrounding fields
Odour Duration (seconds) (5 mins = 300 seconds)	-	-	-	-	Sewage 1 - 45 seconds 2 – 20 seconds Animal 1 – 60 seconds

Other comments/Rationale (record as much info as you can to aid write up in office)	-	-	-	-	Sewage odour very faint and infrequent
Location Number/ Description	**21**	**22**	**23**	**24**	**25**
Time of 'Sniff Test'	1510	1515	1520	1527	1533
Weather conditions	Partly sunny/Dry	Partly sunny/Dry	Partly sunny/Dry	Partly sunny/Dry	Partly sunny/Dry
Wind Speed (m/s)/Direction	2.8, S	2.1, SSE	1.7, SSE/S	3.0, S/SSE	<1m/s, SSE
Upwind/Downwind Location	Downwind	Downwind	Downwind	Downwind	Downwind
Intensity (0 – 6)	1/2	No Odour	No Odour	No Odour	1
Offensiveness (-4 to +4)	-2	-	-	-	-1
Nature of odour	Sewage (faecal)/Animal waste	-	-	-	Animal waste
Potential Source	Clitheroe WWTW/Surrounding fields	-	-	-	Animals in surrounding fields

Odour Duration (seconds) (5 mins = 300 seconds)	Sewage 1 – 10 seconds Animal 2 – 60 seconds	-	-	-	1 – 30 seconds
Other comments/Rationale (record as much info as you can to aid write up in office)	-	Some calm conditions	-	-	Very often calm conditions.
Location Number/ Description	**26**	**27**	**28**		
Time of 'Sniff Test'	1540	1545	1550		
Weather conditions	Partly sunny/Dry	Partly sunny/Dry	Partly sunny/Dry		
Wind Speed (m/s)/Direction	1.3, SSE	3.0, SSE	1.3, SSE/S		
Upwind/Downwind Location	Downwind	Upwind	Downwind		
Intensity (0 – 6)	2/3	No Odour	No Odour		
Offensiveness (-4 to +4)	-3	-	-		
Nature of odour	Sewage (sludge/faecal)	-	-		
Potential Source	Clitheroe WWTW	-	-		

Odour Duration (seconds) (5 mins = 300 seconds)	2 – 30 seconds 3 – 60 seconds	-	-		
Other comments/Rationale (record as much info as you can to aid write up in office)	Some calm conditions. Odour more noticeable during calmer conditions.	-	-		

Job Number:	GM10325	**Site:**	Henthorn Road, Clitheroe	**Date:**	18/11/19
Start time:	13:35	**Finish Time:**	16:30	**Surveyor:**	Paul Threlfall
General Weather Conditions:	**Temperature: 9-10°C** **Cloud Cover: 0/8**			**Wind Direction: SSE/SE** **Wind Strength: Very light, often calm conditions**	
Comments (e.g. site operations, weather changes, general info etc):					

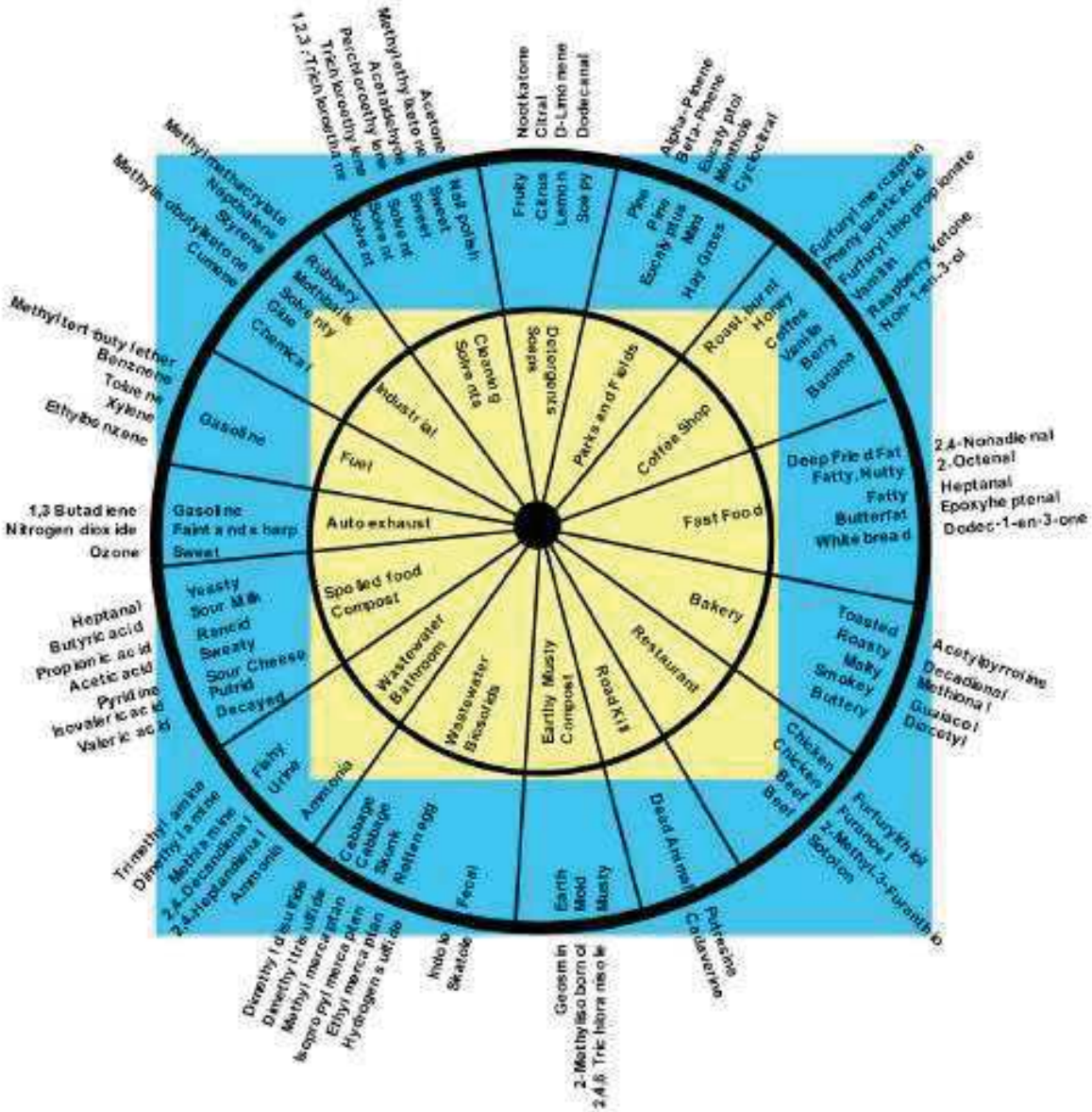
Local Ref. & Description	If first visit – it is useful to stop at site boundary/site entrance to determine the potential odour present. The assessment begins at an upwind location, moving closer to the source and into the downwind location. Record location numbers, mark on map and description of location.
Weather conditions	General description – dry, wet, humid, fog etc.
Temperature	Degrees C (estimate from Met Office or similar) otherwise, very warm, warm, cold, mild etc. Be wary of anemometer readings as they often record the surface temperature on the monitor which, if left in warm car or bag, can give misreading's.
Cloud Cover	Use a scale of 8 where 0 is clear sky and 8 is complete cloud cover. Can convert this number to a percentage.
Wind Strength	Use anemometer as priority, otherwise: Beaufort Scale: 16. Calm (smoke rises vertically) 17. Light Air (direction of wind shown by a smoke drift) 18. Light Breeze (Wind felt on face, leaves rustle) 19. Gentle Breeze (leaves and small twigs in constant movement 20. Moderate Breeze (approx. 5m/s, raises dust and loose paper, small branches move) 21. Fresh Breeze (small tree in leaf begin to sway, small branches move) 22. Strong Breeze (large branches in motion, umbrella used with difficulty) 23. Near Gale (whole trees in motion, inconvenience felt when walking against wind)
Wind Direction	N, NE, NEE etc.
Duration of Test	5 mins minimum. Record any odour detected walking between locations. Note this is standard so does not need to be written in notes.
Intensity	IAQM Guidance 0 to 6. 14. No odour 15. Slight/Very Weak – Potentially odour, may be doubt to whether odour is present 16. Slight/Weak – Odour is present but source/words to describe it are unknown 17. Distinct – Odour character/nature is barely recognisable 18. Strong – Odour character/nature easily recognisable 19. Very Strong – Odour is offensive. Exposure to this level is undesirable 20. Extremely Strong – Odour is offensive. Difficulty staying in locality and instinctive reaction to mitigate against further exposure.
Offensiveness	Use Hedonic Tone score: 3. -4 =extremely unpleasant, 0 = neither unpleasant or pleasant, +4 = extremely pleasant
Nature of Smell	What does it smell like. Use odour wheel where appropriate.
Potential Source	Odour is distinct enough to state a likely source e.g. landfill, sewage treatment works. To be stated when certain of the source (note Intensity 3 is distinct)
Odour Duration	Time 'sniffed' odour for e.g. 30 second 'wave' at intensity 4, 30 Sec @I.4

General Information

Hedonic Score Rating

Very Pleasant	+4
Pleasant	+3
Moderately Pleasant	+2
Mildly Pleasant	+1
Neutral Odour / No Odour	0
Mildly Unpleasant	-1
Moderately Unpleasant	-2
Unpleasant	-3
Very Unpleasant	-4

Odour Wheel



Location Number/ Description	**1**	**2**	**3**	**4**	**5**
Time of 'Sniff Test'	1335	1340	1342	1348	1355
Weather conditions	Sunny/Dry	Sunny/Dry	Sunny/Dry	Sunny/Dry	Sunny/Dry
Wind Speed (m/s)/Direction	<1m/s, SSE	1.3, SSE	1.1, SSE	<1m/s, SSE	<1m/s, SSE
Upwind/Downwind Location	Downwind	Downwind	Downwind	Downwind	Downwind
Intensity (0 – 6)	No Odour	No Odour	No Odour	No Odour	No Odour
Offensiveness (-4 to +4)	-	-	-	-	-
Nature of odour	-	-	-	-	-
Potential Source	-	-	-	-	-
Odour Duration (seconds) (5 mins = 300 seconds)	-	-	-	-	-
Other comments/Rationale (record as much info as you can to aid write up in office)	-	-	Often calm conditions	Often calm conditions	Often calm conditions

Location Number/ Description	**6**	**7**	**8**	**9**	**10**
Time of 'Sniff Test'	1402	1408	1415	1425	1432
Weather conditions	Sunny/Dry	Sunny/Dry	Sunny/Dry	Sunny/Dry	Sunny/Dry
Wind Speed (m/s)/Direction	<1m/s, SSE	1.2, SSE	1.1, SSE	1.1, SSE	1.3, SSE
Upwind/Downwind Location	Downwind	Downwind	Downwind	Downwind	Downwind
Intensity (0 – 6)	No Odour	No Odour	No Odour	No Odour	No Odour
Offensiveness (-4 to +4)	-	-	-	-	-
Nature of odour	-	-	-	-	-
Potential Source	-	-	-	-	-
Odour Duration (seconds) (5 mins = 300 seconds)	-	-	-	-	-
Other comments/Rationale (record as much info as you can to aid write up in office)	-	-	-	-	-

Location Number/ Description	**11**	**12**	**13**	**14**	**15**
Time of 'Sniff Test'	1440	1446	1453	1458	1505
Weather conditions	Sunny/Dry	Sunny/Dry	Sunny/Dry	Sunny/Dry	Sunny/Dry
Wind Speed (m/s)/Direction	<1m/s, SSE	<1m/s, SSE	1.3, SSE	1.4, SSE	1.7, SSE
Upwind/Downwind Location	Downwind	Downwind	Downwind	Downwind	Downwind
Intensity (0 – 6)	1	No Odour	1	No Odour	No Odour
Offensiveness (-4 to +4)	-3	-	-3	-	-
Nature of odour	Animal/Animal waste	-	Animal/Animal waste	-	-
Potential Source	Animals in surrounding fields	-	Animals in surrounding fields	-	-
Odour Duration (seconds) (5 mins = 300 seconds)	1 – 45 seconds	-	1 – 60 seconds	-	-
Other comments/Rationale (record as much info as you can to aid write up in office)	Odour was very faint	-	Location sheltered by trees. Very faint odour	-	-

Location Number/ Description	**16**	**17**	**18**	**19**	**20**
Time of 'Sniff Test'	1510	1516	1531	1537	1545
Weather conditions	Sunny/Dry	Sunny/Dry	Sunny/Dry	Sunny/Dry	Sunny/Dry
Wind Speed (m/s)/Direction	1.5, SSE	1.6, SSE	1.5, SSE	<1m/s, SSE	<1m/s, SSE
Upwind/Downwind Location	Downwind	Downwind	Downwind	Downwind	Downwind
Intensity (0 – 6)	No Odour	No Odour	No Odour	1	No Odour
Offensiveness (-4 to +4)	-	-	-	-3	-
Nature of odour	-	-	-	Animal/Animal waste	-
Potential Source	-	-	-	Animals in surrounding fields	-
Odour Duration (seconds) (5 mins = 300 seconds)	-	-	-	1 – 20 seconds	-
Other comments/Rationale (record as much info as you can to aid write up in office)	-	-	-	Odour very faint and infrequent	-

Location Number/ Description	**21**	**22**	**23**	**24**	**25**
Time of 'Sniff Test'	1550	1555	1600	1606	1611
Weather conditions	Sunny/Dry	Sunny/Dry	Sunny/Dry	Sunny/Dry	Sunny/Dry
Wind Speed (m/s)/Direction	<1m/s, SSE	1.3, SSE	1.4, SSE	1.7, SSE	2.1, SSE
Upwind/Downwind Location	Downwind	Downwind	Downwind	Downwind	Downwind
Intensity (0 – 6)	No Odour	No Odour	No Odour	No Odour	2
Offensiveness (-4 to +4)	-	-	-	-	-2
Nature of odour	-	-	-	-	Sewage (sludge)
Potential Source	-	-	-	-	Clitheroe WWTW
Odour Duration (seconds) (5 mins = 300 seconds)	-	-	-	-	2 – 70 seconds
Other comments/Rationale (record as much info as you can to aid write up in office)	-	Some calm conditions	-	-	Very often calm conditions.

Location Number/ Description	**26**	**27**	**28**		
Time of 'Sniff Test'	1617	1625	1630		
Weather conditions	Sunny/Dry	Sunny/Dry	Sunny/Dry		
Wind Speed (m/s)/Direction	1.7, SSE	1.1, SSE	1.3, SSE		
Upwind/Downwind Location	Downwind	Upwind	Downwind		
Intensity (0 – 6)	1/2/3	No Odour	No Odour		
Offensiveness (-4 to +4)	-3	-	-		
Nature of odour	Sewage (sludge)	-	-		
Potential Source	Clitheroe WWTW	-	-		
Odour Duration (seconds) (5 mins = 300 seconds)	1 – 30 seconds 2 – 20 seconds 3 – 30 seconds	-	-		
Other comments/Rationale (record as much info as you can to aid write up in office)	Some calm conditions.	-	-		

Job Number:	GM10325	**Site:**	Henthorn Road, Clitheroe	**Date:**	25/03/2020
Start time:	09:15	**Finish Time:**	12:01	**Surveyor:**	Paul Threlfall
General Weather Conditions:	**Temperature: 12-16°C** **Cloud Cover: 0/8**		**Wind Direction: S/SSW** **Wind Strength: Very light, often calm conditions**		
Comments (e.g. site operations, weather changes, general info etc): Lots of sheep in bottom of eastern field and in fields beyond that. A general background agricultural odour in the area during the survey					

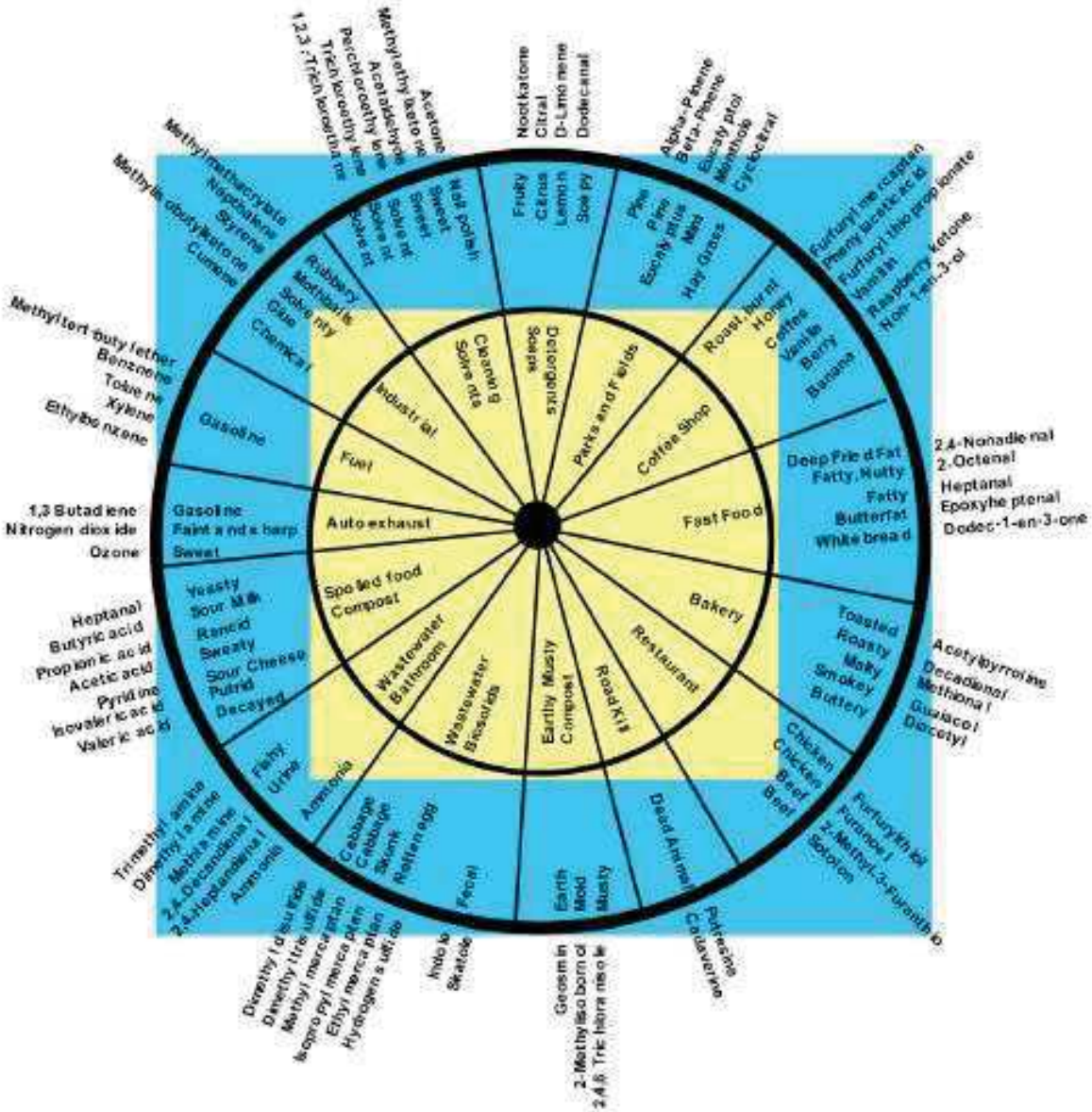
Local Ref. & Description	If first visit – it is useful to stop at site boundary/site entrance to determine the potential odour present. The assessment begins at an upwind location, moving closer to the source and into the downwind location. Record location numbers, mark on map and description of location.
Weather conditions	General description – dry, wet, humid, fog etc.
Temperature	Degrees C (estimate from Met Office or similar) otherwise, very warm, warm, cold, mild etc. Be wary of anemometer readings as they often record the surface temperature on the monitor which, if left in warm car or bag, can give misreading's.
Cloud Cover	Use a scale of 8 where 0 is clear sky and 8 is complete cloud cover. Can convert this number to a percentage.
Wind Strength	Use anemometer as priority, otherwise: Beaufort Scale: 24. Calm (smoke rises vertically) 25. Light Air (direction of wind shown by a smoke drift) 26. Light Breeze (Wind felt on face, leaves rustle) 27. Gentle Breeze (leaves and small twigs in constant movement 28. Moderate Breeze (approx. 5m/s, raises dust and loose paper, small branches move) 29. Fresh Breeze (small tree in leaf begin to sway, small branches move) 30. Strong Breeze (large branches in motion, umbrella used with difficulty) 31. Near Gale (whole trees in motion, inconvenience felt when walking against wind)
Wind Direction	N, NE, NEE etc.
Duration of Test	5 mins minimum. Record any odour detected walking between locations. Note this is standard so does not need to be written in notes.
Intensity	IAQM Guidance 0 to 6. 21. No odour 22. Slight/Very Weak – Potentially odour, may be doubt to whether odour is present 23. Slight/Weak – Odour is present but source/words to describe it are unknown 24. Distinct – Odour character/nature is barely recognisable 25. Strong – Odour character/nature easily recognisable 26. Very Strong – Odour is offensive. Exposure to this level is undesirable 27. Extremely Strong – Odour is offensive. Difficulty staying in locality and instinctive reaction to mitigate against further exposure.
Offensiveness	Use Hedonic Tone score: 4. -4 =extremely unpleasant, 0 = neither unpleasant or pleasant, +4 = extremely pleasant
Nature of Smell	What does it smell like. Use odour wheel where appropriate.
Potential Source	Odour is distinct enough to state a likely source e.g. landfill, sewage treatment works. To be stated when certain of the source (note Intensity 3 is distinct)
Odour Duration	Time 'sniffed' odour for e.g. 30 second 'wave' at intensity 4, 30 Sec @I.4

General Information

Hedonic Score Rating

Very Pleasant	+4
Pleasant	+3
Moderately Pleasant	+2
Mildly Pleasant	+1
Neutral Odour / No Odour	0
Mildly Unpleasant	-1
Moderately Unpleasant	-2
Unpleasant	-3
Very Unpleasant	-4

Odour Wheel



Location Number/ Description	**1**	**2**	**3**	**4**	**5**
Time of 'Sniff Test'	0915	0921	0926	0932	0937
Weather conditions	Sunny/Warm	Sunny/Warm	Sunny/Warm	Sunny/Warm	Sunny/Warm
Wind Speed (m/s)/Direction	1.7, S	1.9, S	2.1, S	<1m/s, S	1.2, S
Upwind/Downwind Location	Upwind	Upwind	Upwind	Upwind	Upwind
Intensity (0 – 6)	No Odour	No Odour	No Odour	No Odour	No Odour
Offensiveness (-4 to +4)	-	-	-	-	-
Nature of odour	-	-	-	-	-
Potential Source	-	-	-	-	-
Odour Duration (seconds) (5 mins = 300 seconds)	-	-	-	-	-
Other comments/Rationale (record as much info as you can to aid write up in office)	-	-	Often calm conditions	-	-

Location Number/ Description	**6**	**7**	**8**	**9**	**10**
Time of 'Sniff Test'	0945	0951	0956	1005	1011
Weather conditions	Sunny/Warm	Sunny/Warm	Sunny/Warm	Sunny/Warm	Sunny/Warm
Wind Speed (m/s)/Direction	1.4, S/SSW	1.7, SSW	<1m/s, S	1.3, SSW/S	1.4, SSW/S
Upwind/Downwind Location	Upwind	Upwind	Upwind	Downwind	Downwind
Intensity (0 – 6)	1/2	1/2	2	2	1/2
Offensiveness (-4 to +4)	-2	-2	-2	-2	-2
Nature of odour	Agricultural/Animal	Agricultural/Animal	Agricultural/Animal	Agricultural/Animal	Agricultural/Animal
Potential Source	Animals in adjacent fields	Animals in adjacent fields	Animals in adjacent fields	Animals in adjacent fields	Animals in adjacent fields
Odour Duration (seconds) (5 mins = 300 seconds)	1 – 30 seconds 2 – 20 seconds	1 – 30 seconds 2 – 30 seconds	2 – 60 seconds	2 – 40 seconds	1 – 30 seconds 2 – 45 seconds
Other comments/Rationale (record as much info as you can to aid write up in office)	-	-	-	-	-

Location Number/ Description	**11**	**12**	**13**	**14**	**15**
Time of 'Sniff Test'	1016	1021	1026	1022	1030
Weather conditions	Sunny/Warm	Sunny/Warm	Sunny/Warm	Sunny/Warm	Sunny/Warm
Wind Speed (m/s)/Direction	1.9, S	2.1, S	2.3, S	1.7, S	1.8, S
Upwind/Downwind Location	Downwind	Downwind	Downwind	Downwind	Downwind
Intensity (0 – 6)	No Odour	No Odour	1/2	1/2	1/2
Offensiveness (-4 to +4)	-	-	-2	-2	-2
Nature of odour	-	-	Agricultural/Animal	Agricultural/Animal	Agricultural/Animal
Potential Source	-	-	Animals in adjacent fields	Animals in adjacent fields	Animals in adjacent fields
Odour Duration (seconds) (5 mins = 300 seconds)	-	-	1 – 30 seconds 2 – 50 seconds	1 – 60 seconds 2 – 30 seconds	1 – 50 seconds 2 – 20 seconds
Other comments/Rationale (record as much info as you can to aid write up in office)	-	-	-	-	-

Location Number/ Description	**16**	**17**	**18**	**19**	**20**
Time of 'Sniff Test'	1036	1041	1046	1051	1105
Weather conditions	Sunny/Warm	Sunny/Warm	Sunny/Warm	Sunny/Warm	Sunny/Warm
Wind Speed (m/s)/Direction	2.1, S/SSW	2.4, SSW	2.0, SSW/S	1.7, S	1.3, S
Upwind/Downwind Location	Upwind	Upwind	Downwind	Downwind	Downwind
Intensity (0 – 6)	1	1	No Odour	1/2	2
Offensiveness (-4 to +4)	-2	-2	-	-2	-2
Nature of odour	Agricultural/Animal	Agricultural/Animal	-	Agricultural/Animal	Agricultural/Animal
Potential Source	Animals in adjacent fields	Animals in adjacent fields	-	Animals in adjacent fields	Animals in adjacent fields
Odour Duration (seconds) (5 mins = 300 seconds)			-	1 – 25 seconds 2 – 40 seconds	2 – 80 seconds
Other comments/Rationale (record as much info as you can to aid write up in office)			-	-	-

Location Number/ Description	**21**	**22**	**23**	**24**	**25**
Time of 'Sniff Test'	1111	1116	1123	1130	1136
Weather conditions	Sunny/Warm	Sunny/Warm	Sunny/Warm	Sunny/Warm	Sunny/Warm
Wind Speed (m/s)/Direction	1.8, S	1.5, S	1.9, S	1.5, S	1.1, SSW/S
Upwind/Downwind Location	Downwind	Downwind	Downwind	Downwind	Downwind
Intensity (0 – 6)	2/3	1/2	1/2	2/3	1/2
Offensiveness (-4 to +4)	-3	-3	-2	-2/ -3	-2
Nature of odour	Faecal/Sludge	Faecal/Sludge	Agricultural/Animal	Agricultural/Faecal, sludge	Agricultural/Animal
Potential Source	Clitheroe WWTW	Clitheroe WWTW	Animals in adjacent fields	Animals/Clitheroe WWTW	Animals in adjacent fields
Odour Duration (seconds) (5 mins = 300 seconds)	2 – 30 seconds 3 – 45 seconds	1 – 20 seconds 2 – 15 seconds	1 – 30 seconds 2 – 120 seconds	<u>Agricultural</u> 3 – 100 seconds <u>Faecal/Sludge</u> 2 – 30 seconds 3 – 30 seconds	1 – 90 seconds 2 – 60 seconds
Other comments/Rationale (record as much info as you can to aid write up in office)	-	-	-	-	-

Location Number/ Description	**26**	**27**	**28**		
Time of 'Sniff Test'	1143	1150	1156		
Weather conditions	Sunny/Warm	Sunny/Warm	Sunny/Warm		
Wind Speed (m/s)/Direction	<1m/s, S/SSW	1.1, S	1.7, S/SSW		
Upwind/Downwind Location	Downwind	Downwind	Upwind		
Intensity (0 – 6)	1	1/2	1		
Offensiveness (-4 to +4)	-2	-2	-2		
Nature of odour	Agricultural/Animal	Agricultural/Faecal, sludge	Agricultural/Animal		
Potential Source	Animals in adjacent fields	Animals/Clitheroe WWTW	Animals in adjacent fields		
Odour Duration (seconds) (5 mins = 300 seconds)	1 – 50 seconds	<u>Agricultural</u> 1 – 40 seconds <u>Faecal/Sludge</u> 2 – 60 seconds	1 – 60 seconds		
Other comments/Rationale (record as much info as you can to aid write up in office)	-	-	-		

Job Number:	GM10325	**Site:**	Henthorn Road, Clitheroe	**Date:**	25/04/2020
Start time:	12:45	**Finish Time:**	15:45	**Surveyor:**	Paul Threlfall
General Weather Conditions:	**Temperature: 18-20°C** **Cloud Cover: 0/8**		**Wind Direction: SSE/S** **Wind Strength: Very light, often calm conditions**		
Comments (e.g. site operations, weather changes, general info etc): No animals in the fields during survey.					

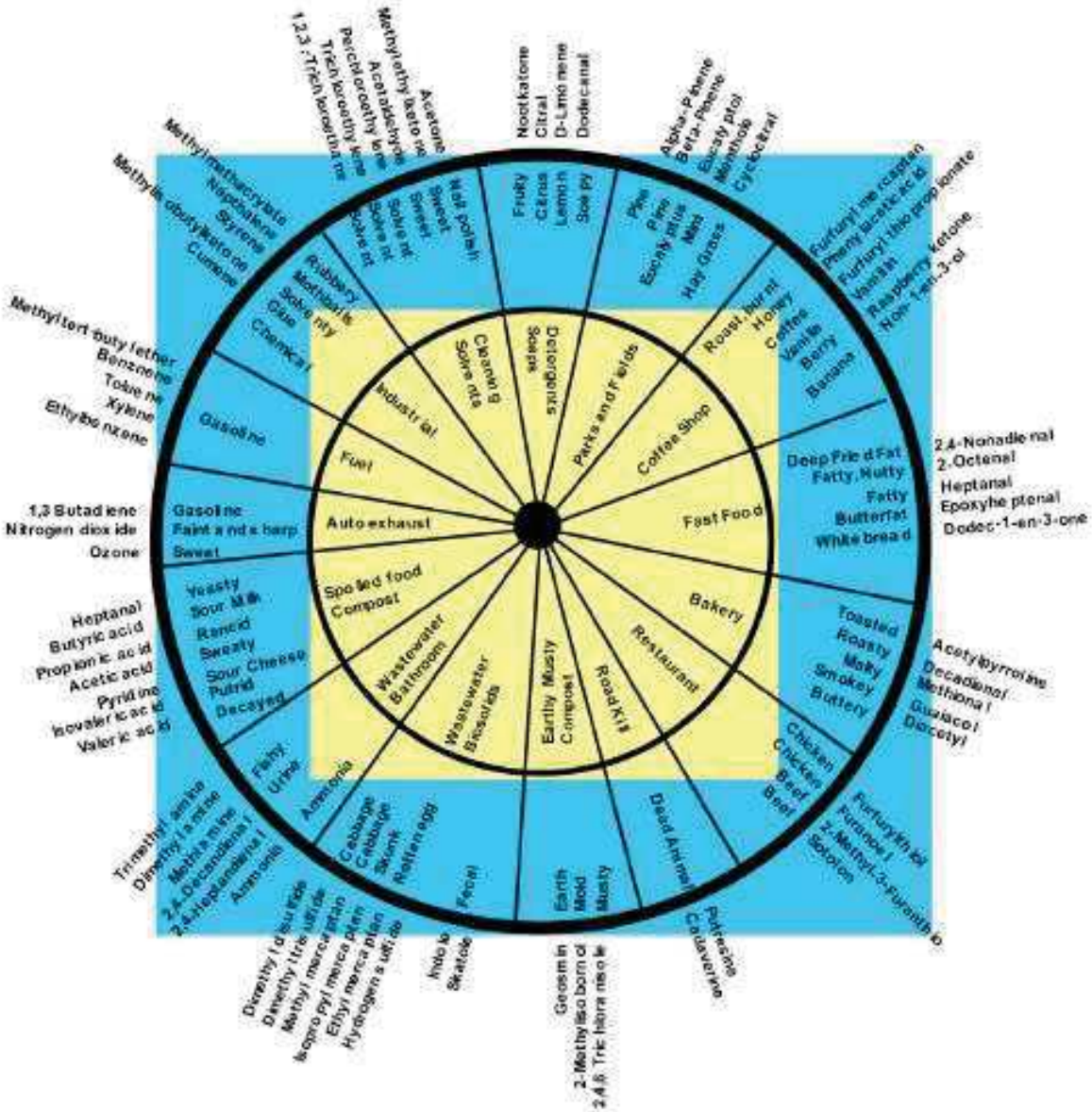
Local Ref. & Description	If first visit – it is useful to stop at site boundary/site entrance to determine the potential odour present. The assessment begins at an upwind location, moving closer to the source and into the downwind location. Record location numbers, mark on map and description of location.
Weather conditions	General description – dry, wet, humid, fog etc.
Temperature	Degrees C (estimate from Met Office or similar) otherwise, very warm, warm, cold, mild etc. Be wary of anemometer readings as they often record the surface temperature on the monitor which, if left in warm car or bag, can give misreading's.
Cloud Cover	Use a scale of 8 where 0 is clear sky and 8 is complete cloud cover. Can convert this number to a percentage.
Wind Strength	Use anemometer as priority, otherwise: Beaufort Scale: 32. Calm (smoke rises vertically) 33. Light Air (direction of wind shown by a smoke drift) 34. Light Breeze (Wind felt on face, leaves rustle) 35. Gentle Breeze (leaves and small twigs in constant movement 36. Moderate Breeze (approx. 5m/s, raises dust and loose paper, small branches move) 37. Fresh Breeze (small tree in leaf begin to sway, small branches move) 38. Strong Breeze (large branches in motion, umbrella used with difficulty) 39. Near Gale (whole trees in motion, inconvenience felt when walking against wind)
Wind Direction	N, NE, NEE etc.
Duration of Test	5 mins minimum. Record any odour detected walking between locations. Note this is standard so does not need to be written in notes.
Intensity	IAQM Guidance 0 to 6. 28. No odour 29. Slight/Very Weak – Potentially odour, may be doubt to whether odour is present 30. Slight/Weak – Odour is present but source/words to describe it are unknown 31. Distinct – Odour character/nature is barely recognisable 32. Strong – Odour character/nature easily recognisable 33. Very Strong – Odour is offensive. Exposure to this level is undesirable 34. Extremely Strong – Odour is offensive. Difficulty staying in locality and instinctive reaction to mitigate against further exposure.
Offensiveness	Use Hedonic Tone score: 5. -4 =extremely unpleasant, 0 = neither unpleasant or pleasant, +4 = extremely pleasant
Nature of Smell	What does it smell like. Use odour wheel where appropriate.
Potential Source	Odour is distinct enough to state a likely source e.g. landfill, sewage treatment works. To be stated when certain of the source (note Intensity 3 is distinct)
Odour Duration	Time 'sniffed' odour for e.g. 30 second 'wave' at intensity 4, 30 Sec @I.4

General Information

Hedonic Score Rating

Very Pleasant	+4
Pleasant	+3
Moderately Pleasant	+2
Mildly Pleasant	+1
Neutral Odour / No Odour	0
Mildly Unpleasant	-1
Moderately Unpleasant	-2
Unpleasant	-3
Very Unpleasant	-4

Odour Wheel



Location Number/ Description	**1**	**2**	**3**	**4**	**5**
Time of 'Sniff Test'	1245	1251	1257	1306	1315
Weather conditions	Sunny/Warm	Sunny/Warm	Sunny/Warm	Sunny/Warm	Sunny/Warm
Wind Speed (m/s)/Direction	1.7, S	1.2, S	1.9, S/SSE	2.1, S/SSE	2.3, S/SSE
Upwind/Downwind Location	Upwind	Upwind	Downwind	Downwind	Downwind
Intensity (0 – 6)	No Odour	No Odour	No Odour	No Odour	No Odour
Offensiveness (-4 to +4)	-	-	-	-	-
Nature of odour	-	-	-	-	-
Potential Source	-	-	-	-	-
Odour Duration (seconds) (5 mins = 300 seconds)	-	-	-	-	-
Other comments/Rationale (record as much info as you can to aid write up in office)	-	Often calm conditions	-	-	-

Location Number/ Description	**6**	**7**	**8**	**9**	**10**
Time of 'Sniff Test'	1321	1328	1334	1345	1350
Weather conditions	Sunny/Warm	Sunny/Warm	Sunny/Warm	Sunny/Warm	Sunny/Warm
Wind Speed (m/s)/Direction	1.7, S/SSE	2.4, S/SSE	2.6, S/SSE	1.8, S/SSE	<1m/s, S/SSE
Upwind/Downwind Location	Downwind	Downwind	Downwind	Downwind	Downwind
Intensity (0 – 6)	1/2	No Odour	No Odour	No Odour	No Odour
Offensiveness (-4 to +4)	-2	-	-	-	-
Nature of odour	Agricultural/Animal	-	-	-	-
Potential Source	Surrounding fields	-	-	-	-
Odour Duration (seconds) (5 mins = 300 seconds)	1 – 60 seconds 2 – 40 seconds	-	-	-	-
Other comments/Rationale (record as much info as you can to aid write up in office)	-	-	-	-	Very often calm conditions

Location Number/ Description	**11**	**12**	**13**	**14**	**15**
Time of 'Sniff Test'	1355	1401	1407	1413	1420
Weather conditions	Sunny/Warm	Sunny/Warm	Sunny/Warm	Sunny/Warm	Sunny/Warm
Wind Speed (m/s)/Direction	1.3, S	2.0, S/SSE	1.9, SSE/S	2.6, SSE/S	1.7, S/SSE
Upwind/Downwind Location	Downwind	Downwind	Downwind	Downwind	Downwind
Intensity (0 – 6)	No Odour	No Odour	No Odour	No Odour	No Odour
Offensiveness (-4 to +4)	-	-	-	-	-
Nature of odour	-	-	-	-	-
Potential Source	-	-	-	-	-
Odour Duration (seconds) (5 mins = 300 seconds)	-	-	-	-	-
Other comments/Rationale (record as much info as you can to aid write up in office)	-	-	-	-	-

Location Number/ Description	**16**	**17**	**18**	**19**	**20**
Time of 'Sniff Test'	1427	1435	1440	1446	1453
Weather conditions	Sunny/Warm	Sunny/Warm	Sunny/Warm	Sunny/Warm	Sunny/Warm
Wind Speed (m/s)/Direction	2.3, S/SSE	2.3, S/SSE	2.1, S/SSE	3.1, S/SSE	2.5, S/SSE
Upwind/Downwind Location	Downwind	Downwind	Downwind	Downwind	Downwind
Intensity (0 – 6)	No Odour	1/2	No Odour	No Odour	No Odour
Offensiveness (-4 to +4)	-	-2	-	-	-
Nature of odour	-	Agricultural/Animal	-	-	-
Potential Source	-	Surrounding fields	-	-	-
Odour Duration (seconds) (5 mins = 300 seconds)	-	1 – 20 seconds 2 – 60 seconds	-	-	-
Other comments/Rationale (record as much info as you can to aid write up in office)	-		-	-	-

Location Number/ Description	**21**	**22**	**23**	**24**	**25**
Time of 'Sniff Test'	1500	1505	1511	1517	1523
Weather conditions	Sunny/Warm	Sunny/Warm	Sunny/Warm	Sunny/Warm	Sunny/Warm
Wind Speed (m/s)/Direction	2.8, S/SSE	1.9, SSE/S	1.7, SSE, S	2.3, SSE/S	2.8, SSE/S
Upwind/Downwind Location	Downwind	Downwind	Downwind	Downwind	Downwind
Intensity (0 – 6)	No Odour	No Odour	No Odour	No Odour	No Odour
Offensiveness (-4 to +4)	-	-	-	-	-
Nature of odour	-	-	-	-	-
Potential Source	-	-	-	-	-
Odour Duration (seconds) (5 mins = 300 seconds)	-	-	-	-	-
Other comments/Rationale (record as much info as you can to aid write up in office)	-	-	-	-	-

Location Number/ Description	**26**	**27**	**28**		
Time of 'Sniff Test'	1530	1535	1540		
Weather conditions	Sunny/Warm	Sunny/Warm	Sunny/Warm		
Wind Speed (m/s)/Direction	1.7, SSE/S	2.1, SSE/S	<1m/s, SSE/S		
Upwind/Downwind Location	Downwind	Downwind	Downwind		
Intensity (0 – 6)	2/3	No Odour	No Odour		
Offensiveness (-4 to +4)	-3	-	-		
Nature of odour	Aeration (sweet)/Inlet Works	-	-		
Potential Source	Clitheroe WWTW	-	-		
Odour Duration (seconds) (5 mins = 300 seconds)	2 – 20 seconds 3 – 35 seconds	-	-		
Other comments/Rationale (record as much info as you can to aid write up in office)	-	-	-		

Job Number:	GM10325	**Site:**	Henthorn Road, Clitheroe	**Date:**	24/06/2020
Start time:	11:45	**Finish Time:**		**Surveyor:**	Paul Threlfall
General Weather Conditions:	**Temperature: 25-26°C** **Cloud Cover: 0/8**		**Wind Direction: S/SSE** **Wind Strength: Very light, often calm conditions**		

Comments (e.g. site operations, weather changes, general info etc): No animals in the fields during survey. Very warm.

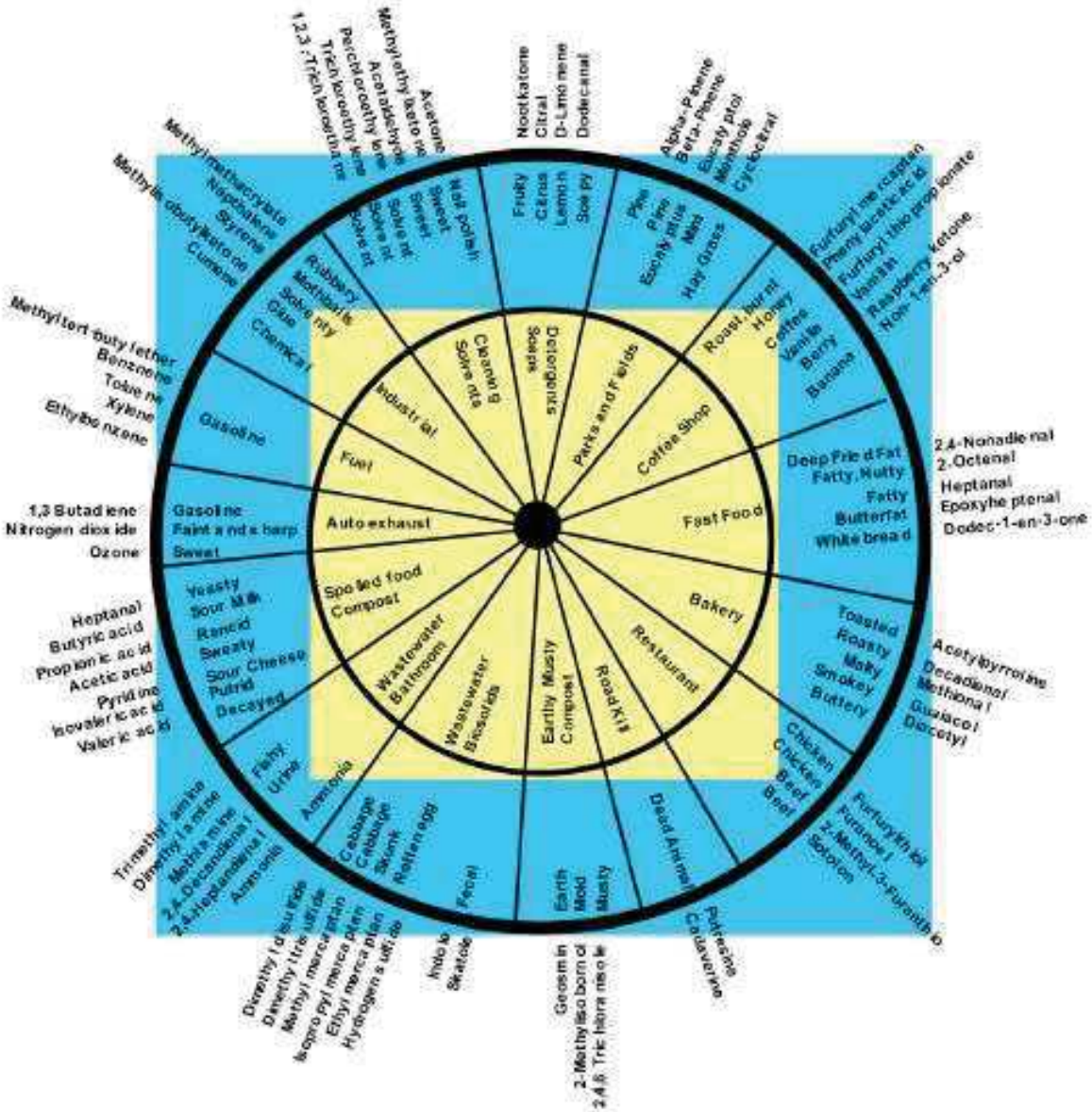
Local Ref. & Description	If first visit – it is useful to stop at site boundary/site entrance to determine the potential odour present. The assessment begins at an upwind location, moving closer to the source and into the downwind location. Record location numbers, mark on map and description of location.
Weather conditions	General description – dry, wet, humid, fog etc.
Temperature	Degrees C (estimate from Met Office or similar) otherwise, very warm, warm, cold, mild etc. Be wary of anemometer readings as they often record the surface temperature on the monitor which, if left in warm car or bag, can give misreading's.
Cloud Cover	Use a scale of 8 where 0 is clear sky and 8 is complete cloud cover. Can convert this number to a percentage.
Wind Strength	Use anemometer as priority, otherwise: Beaufort Scale: 40. Calm (smoke rises vertically) 41. Light Air (direction of wind shown by a smoke drift) 42. Light Breeze (Wind felt on face, leaves rustle) 43. Gentle Breeze (leaves and small twigs in constant movement 44. Moderate Breeze (approx. 5m/s, raises dust and loose paper, small branches move) 45. Fresh Breeze (small tree in leaf begin to sway, small branches move) 46. Strong Breeze (large branches in motion, umbrella used with difficulty) 47. Near Gale (whole trees in motion, inconvenience felt when walking against wind)
Wind Direction	N, NE, NEE etc.
Duration of Test	5 mins minimum. Record any odour detected walking between locations. Note this is standard so does not need to be written in notes.
Intensity	IAQM Guidance 0 to 6. 35. No odour 36. Slight/Very Weak – Potentially odour, may be doubt to whether odour is present 37. Slight/Weak – Odour is present but source/words to describe it are unknown 38. Distinct – Odour character/nature is barely recognisable 39. Strong – Odour character/nature easily recognisable 40. Very Strong – Odour is offensive. Exposure to this level is undesirable 41. Extremely Strong – Odour is offensive. Difficulty staying in locality and instinctive reaction to mitigate against further exposure.
Offensiveness	Use Hedonic Tone score: 6. -4 =extremely unpleasant, 0 = neither unpleasant or pleasant, +4 = extremely pleasant
Nature of Smell	What does it smell like. Use odour wheel where appropriate.
Potential Source	Odour is distinct enough to state a likely source e.g. landfill, sewage treatment works. To be stated when certain of the source (note Intensity 3 is distinct)
Odour Duration	Time 'sniffed' odour for e.g. 30 second 'wave' at intensity 4, 30 Sec @I.4

General Information

Hedonic Score Rating

Very Pleasant	+4
Pleasant	+3
Moderately Pleasant	+2
Mildly Pleasant	+1
Neutral Odour / No Odour	0
Mildly Unpleasant	-1
Moderately Unpleasant	-2
Unpleasant	-3
Very Unpleasant	-4

Odour Wheel



Location Number/ Description	**1**	**2**	**3**	**4**	**5**
Time of 'Sniff Test'	1145	1151	1157	1205	1210
Weather conditions	Sunny/Warm	Sunny/Warm	Sunny/Warm	Sunny/Warm	Sunny/Warm
Wind Speed (m/s)/Direction	2.7, S	3.1, S	1.6, S	2.3, S	3.1, S
Upwind/Downwind Location	Upwind	Upwind	Upwind	Upwind	Upwind
Intensity (0 – 6)	No Odour	No Odour	No Odour	No Odour	No Odour
Offensiveness (-4 to +4)	-	-	-	-	-
Nature of odour	-	-	-	-	-
Potential Source	-	-	-	-	-
Odour Duration (seconds) (5 mins = 300 seconds)	-	-	-	-	-
Other comments/Rationale (record as much info as you can to aid write up in office)	-	-	Some calm conditions	-	-

Location Number/ Description	**6**	**7**	**8**	**9**	**10**
Time of 'Sniff Test'	1216	1222	1230	1240	1245
Weather conditions	Sunny/Warm	Sunny/Warm	Sunny/Warm	Sunny/Warm	Sunny/Warm
Wind Speed (m/s)/Direction	<1m/s, S	2.3, SSE/S	2.1, SSE	3.1, S	2.5, S
Upwind/Downwind Location	Upwind	Downwind	Downwind	Downwind	Downwind
Intensity (0 – 6)	No Odour	No Odour	No Odour	No Odour	No Odour
Offensiveness (-4 to +4)	-	-	-	-	-
Nature of odour	-	-	-	-	-
Potential Source	-	-	-	-	-
Odour Duration (seconds) (5 mins = 300 seconds)	-	-	-	-	-
Other comments/Rationale (record as much info as you can to aid write up in office)	Often calm conditions	-	Some calm conditions	-	-

Location Number/ Description	**11**	**12**	**13**	**14**	**15**
Time of 'Sniff Test'	1251	1256	1304	1310	1316
Weather conditions	Sunny/Warm	Sunny/Warm	Sunny/Warm	Sunny/Warm	Sunny/Warm
Wind Speed (m/s)/Direction	3.4, S	4.0, S	3.2, S	2.8, S	2,7, S
Upwind/Downwind Location	Downwind	Upwind	Downwind	Downwind	Downwind
Intensity (0 – 6)	No Odour	No Odour	1	No Odour	1
Offensiveness (-4 to +4)	-	-	-1	-	-1
Nature of odour	-	-	Agricultural/Animal	-	Agricultural/Animal
Potential Source	-	-	Animals in surrounding fields	-	Animals in surrounding fields
Odour Duration (seconds) (5 mins = 300 seconds)	-	-	1 – 60 seconds	-	1 – 20 seconds
Other comments/Rationale (record as much info as you can to aid write up in office)	-	-	Very faint odour, almost like background	-	Very faint odour, almost like background

Location Number/ Description	**16**	**17**	**18**	**19**	**20**
Time of 'Sniff Test'	1322	1330	1335	1337	1345
Weather conditions	Sunny/Warm	Sunny/Warm	Sunny/Warm	Sunny/Warm	Sunny/Warm
Wind Speed (m/s)/Direction	1.7, S/SSE	2.6, S/SSE	3.1, S/SSE	3.5, S/SSE	<1m/s, S/
Upwind/Downwind Location	Downwind	Upwind	Downwind	Downwind	Downwind
Intensity (0 – 6)	No Odour	No Odour	1	No Odour	3
Offensiveness (-4 to +4)	-	-	-1	-	-3
Nature of odour	-	-	Agricultural/Animal	-	Sludge
Potential Source	-	-	Animals in surrounding fields	-	Clitheroe WWTW
Odour Duration (seconds) (5 mins = 300 seconds)	-	-	1 – 40 seconds	-	3 – 10 seconds
Other comments/Rationale (record as much info as you can to aid write up in office)	-	-	Very faint odour, almost like background	-	Odour came in short bursts. Very often calm conditions

Location Number/ Description	**21**	**22**	**23**	**24**	**25**
Time of 'Sniff Test'	1355	1405	1411	1417	1425
Weather conditions	Sunny/Warm	Sunny/Warm	Sunny/Warm	Sunny/Warm	Sunny/Warm
Wind Speed (m/s)/Direction	3.1, S	1.8, S	3.5, S	2.5, S	2.8, SSE/S
Upwind/Downwind Location	Downwind	Downwind	Downwind	Downwind	Downwind
Intensity (0 – 6)	No Odour	No Odour	No Odour	1	1/2
Offensiveness (-4 to +4)	-	-	-	Faecal/Sludge	-Faecal/Sludge
Nature of odour	-	-	-	-2	-2
Potential Source	-	-	-	Clitheroe WWTW	Clitheroe WWTW
Odour Duration (seconds) (5 mins = 300 seconds)	-	-	-	1 - 30 seconds	1 – 30 seconds 2 – 40 seconds
Other comments/Rationale (record as much info as you can to aid write up in office)	-	-	-	Odour very faint and infrequent.	Odour faint.

Location Number/ Description	**26**	**27**	**28**		
Time of 'Sniff Test'	1435	1442	1448		
Weather conditions	Sunny/Warm	Sunny/Warm	Sunny/Warm		
Wind Speed (m/s)/Direction	1.8, S	2.1, SSE/S	3.1, S		
Upwind/Downwind Location	Downwind	Downwind	Downwind		
Intensity (0 – 6)	1/2/3	2/3	No Odour		
Offensiveness (-4 to +4)	-2	-2	-		
Nature of odour	Aeration (sweet)/Faecal/Sludge	Faecal	-		
Potential Source	Clitheroe WWTW	Clitheroe WWTW	-		
Odour Duration (seconds) (5 mins = 300 seconds)	1 – 30 seconds 2 – 40 seconds 3 – 10 seconds (sludge odour only)	2 – 30 seconds 3 – 10 seconds	-		
Other comments/Rationale (record as much info as you can to aid write up in office)	-	Can detect similar odour as walking towards point 29 but fading quickly	-		

1 SITE VISIT 1 (20TH SEPTEMBER 2019)

Monitoring Location 5 – 7 - Downwind of the WWTW

1.1 These locations were monitored for five minutes each between 12:20 and 12:37

1.2 No odour was detected during any of the 5-minute survey periods. As the odour was not perceptible, the odour effect is therefore deemed to be **negligible**.

Monitoring Location 8 - Downwind of the WWTW

1.3 This location was monitored for five minutes at 12:37.

1.4 Odour was detected during the 5-minute survey period. The maximum odour intensity during the 5-minute observation period was scored at 2 'slight/weak'. The odour detected was 'Animal waste' in nature, with the offensiveness scored at -2 on the hedonic tone scale. The odour was detected intermittently at intensity 1'slight/very weak, for a total duration of 30 seconds and at intensity 2 'slight/weak' for a total of 50 seconds within the 5-minute observation period. No odour was detected during the remainder of the 5-minute observation period.

1.5 It was noted that this odour did not originate from Clitheroe WWTW and instead was from animals in the fields adjacent to the proposed development site.

1.6 The average odour intensity is calculated to be 0 'not perceptible', and in combination with the calculated odour pervasiveness/extent of 0% corresponds to a negligible overall odour exposure with reference to Table 15 of the IAQM guidance and a **negligible** odour effect when taking into account a receptor sensitivity of High.

Monitoring Location 9 – 12 - Downwind of the WWTW

1.7 These locations were monitored for five minutes each between 12:45 and 13:10

No odour was detected during any of the 5-minute survey periods. As the odour was not perceptible, the odour effect is therefore deemed to be **negligible**

Monitoring Location 13: Downwind of the WWTW

1.8 This location was monitored for five minutes at 13:10.

1.9 Odour was detected during the 5-minute survey period. The maximum odour intensity during the 5-minute observation period was scored at 2 'slight/weak'. The odour detected was 'Animal waste' in nature, with the offensiveness scored at -2 on the hedonic tone scale. The odour was detected intermittently at this intensity for a total of 60 seconds within the 5-minute observation period. No odour was detected during the remainder of the 5-minute observation period.

1.10 It was noted that this odour did not originate from Clitheroe WWTW and instead was from animals in the fields adjacent to the proposed development site.

1.11 The average odour intensity is calculated to be 0 'negligible', and in combination with the calculated odour pervasiveness/extent of 0% corresponds to a negligible overall odour exposure with reference to Table 15 of the IAQM guidance and a **negligible** odour effect when taking into account a receptor sensitivity of High.

Monitoring Location 14: Downwind of the WWTW

1.12 This location was monitored for five minutes at 13:12.

1.13 Odour was detected during the 5-minute survey period. The maximum odour intensity during the 5-minute observation period was scored at 2 'slight/weak'. The odour detected was 'Animal waste' in nature, with the offensiveness scored at -2 on the hedonic tone scale. The odour was detected intermittently at this intensity for a total of 60 seconds within the 5-minute observation period. No odour was detected during the remainder of the 5-minute observation period.

1.14 It was noted that this odour did not originate from Clitheroe WWTW and instead was from animals in the fields adjacent to the proposed development site.

1.15 The average odour intensity is calculated to be 0 'negligible', and in combination with the calculated odour pervasiveness/extent of 0% corresponds to a negligible overall odour exposure with reference to Table 15 of the IAQM guidance and a **negligible** odour effect when taking into account a receptor sensitivity of High.

Monitoring Location 15 – 17 - Downwind of the WWTW

1.16 These locations were monitored for five minutes each between 13:17 and 13:35

No odour was detected during any of the 5-minute survey periods. As the odour was not perceptible, the odour effect is therefore deemed to be **negligible**

Monitoring Location 18: Downwind of the WWTW

1.16.1 This location was monitored for five minutes at 13:37.

1.16.2 Odour was detected during the 5-minute survey period. The maximum odour intensity during the 5-minute observation period was scored at 3 'distinct'. The odour detected was 'Animal waste' in nature, with the offensiveness scored at -2 on the hedonic tone scale. The odour was detected intermittently at intensity 2 'slight/ weak' for a total of 10 seconds and at intensity 3 'distinct' for a total duration of 40 seconds within the 5-minute observation period. No odour was detected during the remainder of the 5-minute observation period.

1.16.3 It was noted that this odour did not originate from Clitheroe WWTW and instead was from animals in the fields adjacent to the proposed development site.

1.16.4 The average odour intensity is calculated to be 0 'negligible', and in combination with the calculated odour pervasiveness/extent of 0% corresponds to a negligible overall odour exposure with reference to Table 15 of the IAQM guidance and a **negligible** odour effect when taking into account a receptor sensitivity of High.

Monitoring Location 19 – 22 – Downwind/Upwind of the WWTW

1.17 These locations were monitored for five minutes each between 13:43 and 14:06

No odour was detected during any of the 5-minute survey periods. As the odour was not perceptible, the odour effect is therefore deemed to be **negligible**

Monitoring Location 23: Downwind of the WWTW

1.18 This location was monitored for five minutes at 14:07.

1.18.1 Odour was detected during the 5-minute survey period. The maximum odour intensity during the 5-minute observation period was scored at 3 'distinct'. The odour detected was 'Sewage (inlet)' in nature, with the offensiveness scored at -2 on the hedonic tone scale. The odour was detected intermittently at intensity 2 'slight/ weak' for a total of 30 seconds and at intensity 3 'distinct' for a total duration of 20 seconds within the 5-minute observation period. No odour was detected during the remainder of the 5-minute observation period.

1.19 The average odour intensity is calculated to be 0 'negligible', and in combination with the calculated odour pervasiveness/extent of 0% corresponds to a negligible overall odour exposure with reference to Table 15 of the IAQM guidance and a **negligible** odour effect when taking into account a receptor sensitivity of High.

Monitoring Location 24 - Downwind of the WWTW

1.20 This location was monitored for five minutes at 14:15.

1.21 No odour was detected during the 5-minute survey period. As the odour was not perceptible, the odour effect is therefore deemed to be **negligible**.

Monitoring Location 25: Downwind of the WWTW

1.22 This location was monitored for five minutes at 14:07.

1.22.1 Odour was detected during the 5-minute survey period. The maximum odour intensity during the 5-minute observation period was scored at 3 'distinct'. The odour detected was 'Sludge' and 'Animal waste' in nature, with the offensiveness scored at -3 on the

hedonic tone scale. The 'sludge' odour was detected intermittently at intensity 2 'slight/ weak' for a total of 30 seconds and at intensity 3 'distinct' for a total duration of 40 seconds within the 5-minute observation period. The 'animal waste' odour was detected intermittently at intensity 3 for a total of 90 seconds within the 5-minute observation period. No odour was detected during the remainder of the 5-minute observation period.

1.22.2 It was noted that the 'Animal waste' odour did not originate from Clitheroe WWTW and instead was from animals in the fields adjacent to the proposed development site.

1.23 The average odour intensity for the sludge odour is calculated to be 1 'slight/very weak', and in combination with the calculated odour pervasiveness/extent of 0% corresponds to a small overall odour exposure with reference to Table 15 of the IAQM guidance and a **negligible** odour effect when taking into account a receptor sensitivity of High.

Monitoring Location 26: Downwind of the WWTW

1.24 This location was monitored for five minutes at 14:25.

1.24.1 Odour was detected during the 5-minute survey period. The maximum odour intensity during the 5-minute observation period was scored at 1 'slight/very weak'. The odour detected was 'Sewage (sludge)' in nature, with the offensiveness scored at -3 on the hedonic tone scale. The odour was detected intermittently at this for a total of 10 seconds within the 5-minute observation period. No odour was detected during the remainder of the 5-minute observation period.

1.25 The average odour intensity for the sludge odour is calculated to be 0 'negligible', and in combination with the calculated odour pervasiveness/extent of 0% corresponds to a negligible overall odour exposure with reference to Table 15 of the IAQM guidance and a **negligible** odour effect when taking into account a receptor sensitivity of High.

Monitoring Location 27 - Downwind of the WWTW

1.26 This location was monitored for five minutes at 14:31.

1.27 No odour was detected during the 5-minute survey period. As the odour was not perceptible, the odour effect is therefore deemed to be **negligible**.

Monitoring Location 28: Downwind of the WWTW

1.28 This location was monitored for five minutes at 14:36.

1.29 Odour was detected during the 5-minute survey period. The maximum odour intensity during the 5-minute observation period was scored at 3 'distinct'. The odour detected

was ‘Animal waste’ in nature, with the offensiveness scored at -3 on the hedonic tone scale. The ‘sludge’ odour was detected intermittently at intensity 2 ‘slight/ weak’ for a total of 20 seconds and at intensity 3 ‘distinct’ for a total duration of 20 seconds within the 5-minute observation period. No odour was detected during the remainder of the 5-minute observation period.

1.30 It was noted that the ‘Animal waste’ odour did not originate from Clitheroe WWTW and instead was from animals in the fields adjacent to the proposed development site.

1.31 The average odour intensity for the sludge odour is calculated to be 0 ‘negligible’, and in combination with the calculated odour pervasiveness/extent of 0% corresponds to a negligible overall odour exposure with reference to Table 15 of the IAQM guidance and a **negligible** odour effect when taking into account a receptor sensitivity of High

2 SITE VISIT 2 (23RD SEPTEMBER 2019)

Monitoring Location 1 – 6 - Downwind of the WWTW

2.1 These locations were monitored for five minutes each between 13:05 and 13:45

2.2 No odour was detected during any of the 5-minute survey periods. As the odour was not perceptible, the odour effect is therefore deemed to be **negligible**.

Monitoring Location 7 - Downwind of the WWTW

2.3 This location was monitored for five minutes at 12:37.

2.4 Odour was detected during the 5-minute survey period. The maximum odour intensity during the 5-minute observation period was scored at 1 ‘slight/very weak’. The odour detected was ‘Animal waste’ in nature, with the offensiveness scored at -1 on the hedonic tone scale. The odour was detected intermittently at this intensity for a total of 30 seconds within the 5-minute observation period. No odour was detected during the remainder of the 5-minute observation period.

2.5 It was noted that this odour did not originate from Clitheroe WWTW and instead was from animals in the fields adjacent to the proposed development site.

The average odour intensity is calculated to be 0 ‘not perceptible’, and in combination with the calculated odour pervasiveness/extent of 0% corresponds to a negligible overall odour exposure with reference to Table 15 of the IAQM guidance and a **negligible** odour effect when taking into account a receptor sensitivity of High

Monitoring Location 8 - Downwind of the WWTW

2.6 This location was monitored for five minutes at 12:37.

2.7 Odour was detected during the 5-minute survey period. The maximum odour intensity during the 5-minute observation period was scored at 2 'slight/weak'. The odour detected was 'Animal waste' in nature, with the offensiveness scored at -2 on the hedonic tone scale. The odour was detected intermittently at intensity 1'slight/very weak, for a total duration of 20 seconds and at intensity 2 'slight/weak' for a total of 40 seconds within the 5-minute observation period. No odour was detected during the remainder of the 5-minute observation period.

2.8 It was noted that this odour did not originate from Clitheroe WWTW and instead was from animals in the fields adjacent to the proposed development site.

2.9 The average odour intensity is calculated to be 0 'not perceptible', and in combination with the calculated odour pervasiveness/extent of 0% corresponds to a negligible overall odour exposure with reference to Table 15 of the IAQM guidance and a **negligible** odour effect when taking into account a receptor sensitivity of High.

Monitoring Location 9 – 11 - Downwind of the WWTW

2.10 These locations were monitored for five minutes each between 14:00 and 14:16

No odour was detected during any of the 5-minute survey periods. As the odour was not perceptible, the odour effect is therefore deemed to be **negligible**

Monitoring Location 12: Downwind of the WWTW

2.11 This location was monitored for five minutes at 14:17.

2.12 Odour was detected during the 5-minute survey period. The maximum odour intensity during the 5-minute observation period was scored at 2 'slight/weak'. The odour detected was 'Animal/Animal waste' in nature, with the offensiveness scored at -2 on the hedonic tone scale. The odour was detected intermittently at this intensity for a total of 50 seconds within the 5-minute observation period. No odour was detected during the remainder of the 5-minute observation period.

2.13 It was noted that this odour did not originate from Clitheroe WWTW and instead was from animals in the fields adjacent to the proposed development site.

2.14 The average odour intensity is calculated to be 0 'negligible', and in combination with the calculated odour pervasiveness/extent of 0% corresponds to a negligible overall odour exposure with reference to Table 15 of the IAQM guidance and a **negligible** odour effect when taking into account a receptor sensitivity of High.

Monitoring Location 13: Downwind of the WWTW

2.15 This location was monitored for five minutes at 13:12.

2.16 Odour was detected during the 5-minute survey period. The maximum odour intensity during the 5-minute observation period was scored at 2 'slight/weak'. The odour detected was 'Animal/Animal waste' in nature, with the offensiveness scored at -2 on the hedonic tone scale. The odour was detected intermittently at intensity 1 'slight/very weak' for a total of 10 seconds and at intensity 2 'slight/weak' for a total of 30 seconds within the 5-minute observation period. No odour was detected during the remainder of the 5-minute observation period.

2.17 It was noted that this odour did not originate from Clitheroe WWTW and instead was from animals in the fields adjacent to the proposed development site.

2.18 The average odour intensity is calculated to be 0 'negligible', and in combination with the calculated odour pervasiveness/extent of 0% corresponds to a negligible overall odour exposure with reference to Table 15 of the IAQM guidance and a **negligible** odour effect when taking into account a receptor sensitivity of High.

Monitoring Location 14 – 19 - Downwind of the WWTW

2.19 These locations were monitored for five minutes each between 14:30 and 15:03

No odour was detected during any of the 5-minute survey periods. As the odour was not perceptible, the odour effect is therefore deemed to be **negligible**

Monitoring Location 20: Downwind of the WWTW

2.19.1 This location was monitored for five minutes at 15:05.

2.19.2 Odour was detected during the 5-minute survey period. The maximum odour intensity during the 5-minute observation period was scored at 2 'slight/weak'. The odour detected was 'Sewage (faecal/sludge)' and 'Animal' in nature, with the offensiveness scored at -2 on the hedonic tone scale. The 'Sewage' odour was detected intermittently at intensity 1 'slight/very weak' for a total of 45 seconds and at intensity 2 'slight/ weak' for a total of 20 seconds within the 5-minute observation period. The 'animal' odour was detected intermittently at intensity 1 'slight/very weak' for a total of 60 seconds within the 5-minute observation period. No odour was detected during the remainder of the 5-minute observation period.

2.19.3 It was noted that the 'Animal' odour did not originate from Clitheroe WWTW and instead was from animals in the fields adjacent to the proposed development site.

2.19.4 The average odour intensity for the 'Sewage' odour is calculated to be 0 'negligible', and in combination with the calculated odour pervasiveness/extent of 0% corresponds to a negligible overall odour exposure with reference to Table 15 of the IAQM guidance and a **negligible** odour effect when taking into account a receptor sensitivity of High.

Monitoring Location 21: Downwind of the WWTW

2.19.5 This location was monitored for five minutes at 15:10.

2.19.6 Odour was detected during the 5-minute survey period. The maximum odour intensity during the 5-minute observation period was scored at 2 'slight/weak'. The odour detected was 'Sewage (faecal)' and 'Animal waste' in nature, with the offensiveness scored at -2 on the hedonic tone scale. The 'Sewage' odour was detected intermittently at intensity 1 'slight/very weak' for a total of 10 within the 5-minute observation period. The 'animal waste' odour was detected intermittently at intensity 2 'slight/weak' for a total of 60 seconds within the 5-minute observation period. No odour was detected during the remainder of the 5-minute observation period.

2.19.7 It was noted that the 'Animal' odour did not originate from Clitheroe WWTW and instead was from animals in the fields adjacent to the proposed development site.

2.19.8 The average odour intensity for the 'Sewage' odour is calculated to be 0 'negligible', and in combination with the calculated odour pervasiveness/extent of 0% corresponds to a negligible overall odour exposure with reference to Table 15 of the IAQM guidance and a **negligible** odour effect when taking into account a receptor sensitivity of High.

Monitoring Location 22 – 24 – Downwind of the WWTW

2.20 These locations were monitored for five minutes each between 15:15 and 15:32

No odour was detected during any of the 5-minute survey periods. As the odour was not perceptible, the odour effect is therefore deemed to be **negligible**

Monitoring Location 25: Downwind of the WWTW

2.21 This location was monitored for five minutes at 15:33.

2.22 Odour was detected during the 5-minute survey period. The maximum odour intensity during the 5-minute observation period was scored at 1 'slight/very weak'. The odour detected was 'Animal waste' in nature, with the offensiveness scored at -1 on the hedonic tone scale. The odour was detected intermittently at this intensity for a total

of 30 seconds within the 5-minute observation period. No odour was detected during the remainder of the 5-minute observation period.

2.22.1 It was noted that the 'Animal' odour did not originate from Clitheroe WWTW and instead was from animals in the fields adjacent to the proposed development site.

2.23 The average odour intensity is calculated to be 0 'negligible', and in combination with the calculated odour pervasiveness/extent of 0% corresponds to a negligible overall odour exposure with reference to Table 15 of the IAQM guidance and a **negligible** odour effect when taking into account a receptor sensitivity of High.

Monitoring Location 26: Downwind of the WWTW

2.24 This location was monitored for five minutes at 14:07.

2.24.1 Odour was detected during the 5-minute survey period. The maximum odour intensity during the 5-minute observation period was scored at 3 'distinct'. The odour detected was 'Sewage (sludge/faecal)' in nature, with the offensiveness scored at -3 on the hedonic tone scale. The 'Sewage' odour was detected intermittently at intensity 2 'slight/ weak' for a total of 30 seconds and at intensity 3 'distinct' for a total duration of 60 seconds within the 5-minute observation period. No odour was detected during the remainder of the 5-minute observation period.

2.25 The average odour intensity for the sludge odour is calculated to be 1 'slight/very weak', and in combination with the calculated odour pervasiveness/extent of 0% corresponds to a small overall odour exposure with reference to Table 15 of the IAQM guidance and a **negligible** odour effect when taking into account a receptor sensitivity of High.

Monitoring Location 27 - 28 Upwind/Downwind of the WWTW

2.26 These locations were monitored for five minutes between 15:45 and 15:55.

2.27 No odour was detected during the 5-minute survey period. As the odour was not perceptible, the odour effect is therefore deemed to be **negligible**.

3 SITE VISIT 3 (18TH NOVEMBER 2019)

Monitoring Location 1 – 10 - Downwind of the WWTW

3.1 These locations were monitored for five minutes each between 13:35 and 14:37

3.2 No odour was detected during any of the 5-minute survey periods. As the odour was not perceptible, the odour effect is therefore deemed to be **negligible**.

Monitoring Location 11 - Downwind of the WWTW

3.3 This location was monitored for five minutes at 14:40.

3.4 Odour was detected during the 5-minute survey period. The maximum odour intensity during the 5-minute observation period was scored at 1 'slight/very weak'. The odour detected was 'Animal/Animal waste' in nature, with the offensiveness scored at -3 on the hedonic tone scale. The odour was detected intermittently at this intensity for a total of 45 seconds within the 5-minute observation period. No odour was detected during the remainder of the 5-minute observation period.

3.5 It was noted that this odour did not originate from Clitheroe WWTW and instead was from animals in the fields adjacent to the proposed development site.

The average odour intensity is calculated to be 0 'not perceptible', and in combination with the calculated odour pervasiveness/extent of 0% corresponds to a negligible overall odour exposure with reference to Table 15 of the IAQM guidance and a **negligible** odour effect when taking into account a receptor sensitivity of High

Monitoring Location 12 - Downwind of the WWTW

3.6 This location was monitored for five minutes at 14:46.

No odour was detected during the 5-minute survey period. As the odour was not perceptible, the odour effect is therefore deemed to be **negligible**

Monitoring Location 13 - Downwind of the WWTW

3.7 This location was monitored for five minutes at 14:53.

3.8 Odour was detected during the 5-minute survey period. The maximum odour intensity during the 5-minute observation period was scored at 1 'slight/very weak'. The odour detected was 'Animal/Animal waste' in nature, with the offensiveness scored at -3 on the hedonic tone scale. The odour was detected intermittently at this intensity for a total of 60 seconds within the 5-minute observation period. No odour was detected during the remainder of the 5-minute observation period.

3.9 It was noted that this odour did not originate from Clitheroe WWTW and instead was from animals in the fields adjacent to the proposed development site.

3.10 The average odour intensity is calculated to be 0 'not perceptible', and in combination with the calculated odour pervasiveness/extent of 0% corresponds to a negligible

overall odour exposure with reference to Table 15 of the IAQM guidance and a **negligible** odour effect when taking into account a receptor sensitivity of High

Monitoring Location 14 – 18 - Downwind of the WWTW

3.11 These locations were monitored for five minutes each between 14:58 and 15:36

No odour was detected during any of the 5-minute survey periods. As the odour was not perceptible, the odour effect is therefore deemed to be **negligible**

Monitoring Location 19: Downwind of the WWTW

3.12 This location was monitored for five minutes at 15:37.

3.13 Odour was detected during the 5-minute survey period. The maximum odour intensity during the 5-minute observation period was scored at 1 'slight/very weak'. The odour detected was 'Animal/Animal waste' in nature, with the offensiveness scored at -3 on the hedonic tone scale. The odour was detected intermittently at this intensity for a total of 20 seconds within the 5-minute observation period. No odour was detected during the remainder of the 5-minute observation period.

3.14 It was noted that this odour did not originate from Clitheroe WWTW and instead was from animals in the fields adjacent to the proposed development site.

3.15 The average odour intensity is calculated to be 0 'not perceptible', and in combination with the calculated odour pervasiveness/extent of 0% corresponds to a negligible overall odour exposure with reference to Table 15 of the IAQM guidance and a **negligible** odour effect when taking into account a receptor sensitivity of High.

Monitoring Location 20 – 24 - Downwind of the WWTW

3.16 These locations were monitored for five minutes each between 15:45 and 16:11

No odour was detected during any of the 5-minute survey periods. As the odour was not perceptible, the odour effect is therefore deemed to be **negligible**

Monitoring Location 25: Downwind of the WWTW

3.16.1 This location was monitored for five minutes at 15:05.

3.16.2 Odour was detected during the 5-minute survey period. The maximum odour intensity during the 5-minute observation period was scored at 2 'slight/weak'. The odour detected was 'Sewage (sludge)' in nature, with the offensiveness scored at -2 on the hedonic tone scale. The odour was detected intermittently at this intensity for a total of 70 seconds within the 5-minute observation period. No odour was detected during the remainder of the 5-minute observation period.

3.16.3 The average odour intensity is calculated to be 0 'not perceptible', and in combination with the calculated odour pervasiveness/extent of 0% corresponds to a negligible overall odour exposure with reference to Table 15 of the IAQM guidance and a **negligible** odour effect when taking into account a receptor sensitivity of High.

Monitoring Location 26: Downwind of the WWTW

3.16.4 This location was monitored for five minutes at 16:17.

3.16.5 Odour was detected during the 5-minute survey period. The maximum odour intensity during the 5-minute observation period was scored at 3 'distinct'. The odour detected was 'Sewage (sludge)' in nature, with the offensiveness scored at -3 on the hedonic tone scale. The odour was detected intermittently at intensity 1 'slight/very weak' for a total of 30 seconds, at intensity 2 'slight/weak' for a total of 20 seconds and at intensity 3 'distinct' for a total of 30 seconds within the 5-minute observation period.. No odour was detected during the remainder of the 5-minute observation period.

3.16.6 The average odour intensity is calculated to be 1 'slight/very weak', and in combination with the calculated odour pervasiveness/extent of 0% corresponds to a negligible overall odour exposure with reference to Table 15 of the IAQM guidance and a **negligible** odour effect when taking into account a receptor sensitivity of High.

Monitoring Location 27 - 28 Upwind/Downwind of the WWTW

3.17 These locations were monitored for five minutes between 16:25 and 16:35.

3.18 No odour was detected during the 5-minute survey period. As the odour was not perceptible, the odour effect is therefore deemed to be **negligible**.

4 SITE VISIT 4 (25TH MARCH 2020)

Monitoring Location 1 – 5 - Upwind of the WWTW

4.1 These locations were monitored for five minutes each between 09:15 and 09:42

4.2 No odour was detected during any of the 5-minute survey periods. As the odour was not perceptible, the odour effect is therefore deemed to be **negligible**.

Monitoring Location 6 - Upwind of the WWTW

4.3 This location was monitored for five minutes at 09:45.

4.4 Odour was detected during the 5-minute survey period. The maximum odour intensity during the 5-minute observation period was scored at 2 'slight/ weak'. The odour detected was 'Agricultural/Animal 'in nature, with the offensiveness scored at -2 on

the hedonic tone scale. The odour was detected intermittently at intensity 1 ‘slight/very weak’ for a total of 30 seconds and at intensity 2 ‘slight/weak’ for a total of 20 seconds within the 5-minute observation period. No odour was detected during the remainder of the 5-minute observation period.

4.5 It was noted that this odour did not originate from Clitheroe WWTW and instead was from animals in the fields adjacent to the proposed development site.

4.6 The average odour intensity is calculated to be 0 ‘not perceptible’, and in combination with the calculated odour pervasiveness/extent of 0% corresponds to a negligible overall odour exposure with reference to Table 15 of the IAQM guidance and a **negligible** odour effect when taking into account a receptor sensitivity of High.

Monitoring Location 7 - Upwind of the WWTW

4.7 This location was monitored for five minutes at 09:51.

4.8 Odour was detected during the 5-minute survey period. The maximum odour intensity during the 5-minute observation period was scored at 2 ‘slight/ weak’. The odour detected was ‘Agricultural/Animal’ in nature, with the offensiveness scored at -2 on the hedonic tone scale. The odour was detected intermittently at intensity 1 ‘slight/very weak’ for a total of 30 seconds and at intensity 2 ‘slight/weak’ for a total of 30 seconds within the 5-minute observation period. No odour was detected during the remainder of the 5-minute observation period.

4.9 It was noted that this odour did not originate from Clitheroe WWTW and instead was from animals in the fields adjacent to the proposed development site.

4.10 The average odour intensity is calculated to be 0 ‘not perceptible’, and in combination with the calculated odour pervasiveness/extent of 0% corresponds to a negligible overall odour exposure with reference to Table 15 of the IAQM guidance and a **negligible** odour effect when taking into account a receptor sensitivity of High.

Monitoring Location 8 - Upwind of the WWTW

4.11 This location was monitored for five minutes at 09:56.

4.12 Odour was detected during the 5-minute survey period. The maximum odour intensity during the 5-minute observation period was scored at 2 ‘slight/ weak’. The odour detected was ‘Agricultural/Animal’ in nature, with the offensiveness scored at -2 on the hedonic tone scale. The odour was detected intermittently at this intensity for a total of 60 seconds within the 5-minute observation period. No odour was detected during the remainder of the 5-minute observation period.

4.13 It was noted that this odour did not originate from Clitheroe WWTW and instead was from animals in the fields adjacent to the proposed development site.

4.14 The average odour intensity is calculated to be 0 'not perceptible', and in combination with the calculated odour pervasiveness/extent of 0% corresponds to a negligible overall odour exposure with reference to Table 15 of the IAQM guidance and a **negligible** odour effect when taking into account a receptor sensitivity of High.

Monitoring Location 9 - Downwind of the WWTW

4.15 This location was monitored for five minutes at 10:05.

4.16 Odour was detected during the 5-minute survey period. The maximum odour intensity during the 5-minute observation period was scored at 2 'slight/ weak'. The odour detected was 'Agricultural/Animal' in nature, with the offensiveness scored at -2 on the hedonic tone scale. The odour was detected intermittently at this intensity for a total of 40 seconds within the 5-minute observation period. No odour was detected during the remainder of the 5-minute observation period.

4.17 It was noted that this odour did not originate from Clitheroe WWTW and instead was from animals in the fields adjacent to the proposed development site.

4.18 The average odour intensity is calculated to be 0 'not perceptible', and in combination with the calculated odour pervasiveness/extent of 0% corresponds to a negligible overall odour exposure with reference to Table 15 of the IAQM guidance and a **negligible** odour effect when taking into account a receptor sensitivity of High.

Monitoring Location 10 - Downwind of the WWTW

4.19 This location was monitored for five minutes at 10:11.

4.20 Odour was detected during the 5-minute survey period. The maximum odour intensity during the 5-minute observation period was scored at 2 'slight/ weak'. The odour detected was 'Agricultural/Animal' in nature, with the offensiveness scored at -2 on the hedonic tone scale. The odour was detected intermittently at intensity 1 'slight/very weak' for a total of 30 seconds and at intensity 2 'slight/weak' for a total of 45 seconds within the 5-minute observation period. No odour was detected during the remainder of the 5-minute observation period.

4.21 It was noted that this odour did not originate from Clitheroe WWTW and instead was from animals in the fields adjacent to the proposed development site.

4.22 The average odour intensity is calculated to be 0 'not perceptible', and in combination with the calculated odour pervasiveness/extent of 0% corresponds to a negligible

overall odour exposure with reference to Table 15 of the IAQM guidance and a **negligible** odour effect when taking into account a receptor sensitivity of High.

Monitoring Locations 11 - 12 - Downwind of the WWTW

4.23 These locations were monitored for five minutes each between 10:16 and 10:26.

No odour was detected during the 5-minute survey periods. As the odour was not perceptible, the odour effect is therefore deemed to be **negligible**

Monitoring Location 13 - Downwind of the WWTW

4.24 This location was monitored for five minutes at 10:26.

4.25 Odour was detected during the 5-minute survey period. The maximum odour intensity during the 5-minute observation period was scored at 2 'slight/ weak'. The odour detected was 'Agricultural/Animal' in nature, with the offensiveness scored at -2 on the hedonic tone scale. The odour was detected intermittently at intensity 1 'slight/very weak' for a total of 30 seconds and at intensity 2 'slight/weak' for a total of 50 seconds within the 5-minute observation period. No odour was detected during the remainder of the 5-minute observation period.

4.26 It was noted that this odour did not originate from Clitheroe WWTW and instead was from animals in the fields adjacent to the proposed development site.

4.27 The average odour intensity is calculated to be 0 'not perceptible', and in combination with the calculated odour pervasiveness/extent of 0% corresponds to a negligible overall odour exposure with reference to Table 15 of the IAQM guidance and a **negligible** odour effect when taking into account a receptor sensitivity of High.

Monitoring Location 14 - Downwind of the WWTW

4.28 This location was monitored for five minutes at 10:32.

4.29 Odour was detected during the 5-minute survey period. The maximum odour intensity during the 5-minute observation period was scored at 2 'slight/ weak'. The odour detected was 'Agricultural/Animal' in nature, with the offensiveness scored at -2 on the hedonic tone scale. The odour was detected intermittently at intensity 1 'slight/very weak' for a total of 60 seconds and at intensity 2 'slight/weak' for a total of 30 seconds within the 5-minute observation period. No odour was detected during the remainder of the 5-minute observation period.

4.30 It was noted that this odour did not originate from Clitheroe WWTW and instead was from animals in the fields adjacent to the proposed development site.

4.31 The average odour intensity is calculated to 0 ‘not perceptible’, and in combination with the calculated odour pervasiveness/extent of 0% corresponds to a negligible overall odour exposure with reference to Table 15 of the IAQM guidance and a **negligible** odour effect when taking into account a receptor sensitivity of High.

Monitoring Location 15 - Downwind of the WWTW

4.32 This location was monitored for five minutes at 10:40.

4.33 Odour was detected during the 5-minute survey period. The maximum odour intensity during the 5-minute observation period was scored at 2 ‘slight/ weak’. The odour detected was ‘Agricultural/Animal’ in nature, with the offensiveness scored at -2 on the hedonic tone scale. The odour was detected intermittently at intensity 1 ‘slight/very weak’ for a total of 50 seconds and at intensity 2 ‘slight/weak’ for a total of 20 seconds within the 5-minute observation period. No odour was detected during the remainder of the 5-minute observation period.

4.34 It was noted that this odour did not originate from Clitheroe WWTW and instead was from animals in the fields adjacent to the proposed development site.

4.35 The average odour intensity is calculated to be 0 ‘not perceptible’, and in combination with the calculated odour pervasiveness/extent of 0% corresponds to a negligible overall odour exposure with reference to Table 15 of the IAQM guidance and a **negligible** odour effect when taking into account a receptor sensitivity of High.

Monitoring Location 16 - Upwind of the WWTW

4.36 This location was monitored for five minutes at 10:46.

4.37 Odour was detected during the 5-minute survey period. The maximum odour intensity during the 5-minute observation period was scored at 1 ‘slight/very weak’. The odour detected was ‘Agricultural/Animal’ in nature, with the offensiveness scored at -2 on the hedonic tone scale. The odour was detected intermittently at this intensity for a total of 40 seconds within the 5-minute observation period. No odour was detected during the remainder of the 5-minute observation period.

4.38 It was noted that this odour did not originate from Clitheroe WWTW and instead was from animals in the fields adjacent to the proposed development site.

4.39 The average odour intensity is calculated to be 0 ‘not perceptible’, and in combination with the calculated odour pervasiveness/extent of 0% corresponds to a negligible overall odour exposure with reference to Table 15 of the IAQM guidance and a **negligible** odour effect when taking into account a receptor sensitivity of High.

Monitoring Location 17 - Upwind of the WWTW

4.40 This location was monitored for five minutes at 10:52.

4.41 Odour was detected during the 5-minute survey period. The maximum odour intensity during the 5-minute observation period was scored at 1 'slight/very weak'. The odour detected was 'Agricultural/Animal' in nature, with the offensiveness scored at -2 on the hedonic tone scale. The odour was detected intermittently at this intensity for a total of 35 seconds within the 5-minute observation period. No odour was detected during the remainder of the 5-minute observation period.

4.42 It was noted that this odour did not originate from Clitheroe WWTW and instead was from animals in the fields adjacent to the proposed development site.

4.43 The average odour intensity is calculated to be 0 'not perceptible', and in combination with the calculated odour pervasiveness/extent of 0% corresponds to a negligible overall odour exposure with reference to Table 15 of the IAQM guidance and a **negligible** odour effect when taking into account a receptor sensitivity of High.

Monitoring Location 18 - Downwind of the WWTW

4.44 This location was monitored for five minutes at 10:57.

No odour was detected during the 5-minute survey period. As the odour was not perceptible, the odour effect is therefore deemed to be **negligible.**

Monitoring Location 19 - Downwind of the WWTW

4.45 This location was monitored for five minutes at 11:05.

4.46 Odour was detected during the 5-minute survey period. The maximum odour intensity during the 5-minute observation period was scored at 2 'slight/ weak'. The odour detected was 'Agricultural/Animal' in nature, with the offensiveness scored at -2 on the hedonic tone scale. The odour was detected intermittently at intensity 1 'slight/very weak' for a total of 25 seconds and at intensity 2 'slight/weak' for a total of 40 seconds within the 5-minute observation period. No odour was detected during the remainder of the 5-minute observation period.

4.47 It was noted that this odour did not originate from Clitheroe WWTW and instead was from animals in the fields adjacent to the proposed development site.

4.48 The average odour intensity is calculated to be 0 'not perceptible', and in combination with the calculated odour pervasiveness/extent of 0% corresponds to a negligible overall odour exposure with reference to Table 15 of the IAQM guidance and a **negligible** odour effect when taking into account a receptor sensitivity of High.

Monitoring Location 20 - Upwind of the WWTW

4.49 This location was monitored for five minutes at 11:11.

4.50 Odour was detected during the 5-minute survey period. The maximum odour intensity during the 5-minute observation period was scored at 2 'slight/ weak'. The odour detected was 'Agricultural/Animal' in nature, with the offensiveness scored at -2 on the hedonic tone scale. The odour was detected intermittently at this intensity for a total of 80 seconds within the 5-minute observation period. No odour was detected during the remainder of the 5-minute observation period.

4.51 It was noted that this odour did not originate from Clitheroe WWTW and instead was from animals in the fields adjacent to the proposed development site.

4.52 The average odour intensity is calculated to be 1 'slight adverse', and in combination with the calculated odour pervasiveness/extent of 0% corresponds to a negligible overall odour exposure with reference to Table 15 of the IAQM guidance and a **negligible** odour effect when taking into account a receptor sensitivity of High.

Monitoring Location 21 - Upwind of the WWTW

4.53 This location was monitored for five minutes at 11:16.

4.54 Odour was detected during the 5-minute survey period. The maximum odour intensity during the 5-minute observation period was scored at 3 'distinct'. The odour detected was 'Faecal/Sludge' in nature, with the offensiveness scored at -3 on the hedonic tone scale. The odour was detected intermittently at intensity 2 'slight/weak' for a total of 30 seconds and at intensity 3 'distinct' for a total of 45 seconds within the 5-minute observation period. No odour was detected during the remainder of the 5-minute observation period.

4.55 The average odour intensity is calculated to be 1 'slight adverse', and in combination with the calculated odour pervasiveness/extent of 0% corresponds to a negligible overall odour exposure with reference to Table 15 of the IAQM guidance and a **negligible** odour effect when taking into account a receptor sensitivity of High.

Monitoring Location 22 - Downwind of the WWTW

4.56 This location was monitored for five minutes at 11:22.

4.57 Odour was detected during the 5-minute survey period. The maximum odour intensity during the 5-minute observation period was scored at 2 'slight/ weak'. The odour detected was 'Faecal/Sludge' in nature, with the offensiveness scored at -3 on the hedonic tone scale. The odour was detected intermittently at intensity 1 'slight/very

weak' for a total of 20 seconds and at intensity 2 'slight/weak' for a total of 15 seconds within the 5-minute observation period. No odour was detected during the remainder of the 5-minute observation period.

4.58 The average odour intensity is calculated to be 0 'not perceptible', and in combination with the calculated odour pervasiveness/extent of 0% corresponds to a negligible overall odour exposure with reference to Table 15 of the IAQM guidance and a **negligible** odour effect when taking into account a receptor sensitivity of High.

Monitoring Location 23 - Downwind of the WWTW

4.59 This location was monitored for five minutes at 11:28.

4.60 Odour was detected during the 5-minute survey period. The maximum odour intensity during the 5-minute observation period was scored at 2 'slight/ weak'. The odour detected was 'Agricultural/Animal' in nature, with the offensiveness scored at -2 on the hedonic tone scale. The odour was detected intermittently at intensity 1 'slight/very weak' for a total of 30 seconds and at intensity 2 'slight/weak' for a total of 120 seconds within the 5-minute observation period. No odour was detected during the remainder of the 5-minute observation period.

4.61 It was noted that this odour did not originate from Clitheroe WWTW and instead was from animals in the fields adjacent to the proposed development site.

4.62 The average odour intensity is calculated to be 1 'slight/very weak', and in combination with the calculated odour pervasiveness/extent of 0% corresponds to a negligible overall odour exposure with reference to Table 15 of the IAQM guidance and a **negligible** odour effect when taking into account a receptor sensitivity of High.

Monitoring Location 24: Downwind of the WWTW

4.62.1 This location was monitored for five minutes at 11:35.

4.62.2 Odour was detected during the 5-minute survey period. The maximum odour intensity during the 5-minute observation period was scored at 3 'distinct'. The odour detected was 'Faecal/sludge' and 'Agricultural' in nature, with the offensiveness scored at -3 and -2 respectively on the hedonic tone scale. The 'Faecal/sludge' odour was detected intermittently at intensity 2 'slight/weak' for a total of 30 seconds and at intensity 3 'distinct' for a total of 30 seconds within the 5-minute observation period. The 'agricultural' odour was detected intermittently at intensity 3 'distinct' for a total of 100 seconds within the 5-minute observation period. No odour was detected during the remainder of the 5-minute observation period.

4.62.3 It was noted that the 'Agricultural' odour did not originate from Clitheroe WWTW and instead was from animals in the fields adjacent to the proposed development site.

4.62.4 The average odour intensity for the 'Faecal/sludge' odour is calculated to be 1 'slight/very weak', and in combination with the calculated odour pervasiveness/extent of 0% corresponds to a negligible overall odour exposure with reference to Table 15 of the IAQM guidance and a **negligible** odour effect when taking into account a receptor sensitivity of High.

Monitoring Location 25 - Downwind of the WWTW

4.63 This location was monitored for five minutes at 11:41.

4.64 Odour was detected during the 5-minute survey period. The maximum odour intensity during the 5-minute observation period was scored at 2 'slight/ weak'. The odour detected was 'Agricultural/Animal' in nature, with the offensiveness scored at -2 on the hedonic tone scale. The odour was detected intermittently at intensity 1 'slight/very weak' for a total of 90 seconds and at intensity 2 'slight/weak' for a total of 60 seconds within the 5-minute observation period. No odour was detected during the remainder of the 5-minute observation period.

4.65 It was noted that this odour did not originate from Clitheroe WWTW and instead was from animals in the fields adjacent to the proposed development site.

4.66 The average odour intensity is calculated to be 1 'slight/very weak', and in combination with the calculated odour pervasiveness/extent of 0% corresponds to a negligible overall odour exposure with reference to Table 15 of the IAQM guidance and a **negligible** odour effect when taking into account a receptor sensitivity of High.

Monitoring Location 26 - Downwind of the WWTW

4.67 This location was monitored for five minutes at 11:47.

4.68 Odour was detected during the 5-minute survey period. The maximum odour intensity during the 5-minute observation period was scored at 1 'slight/very weak'. The odour detected was 'Agricultural/Animal' in nature, with the offensiveness scored at -2 on the hedonic tone scale. The odour was detected intermittently at this intensity for a total of 50 seconds within the 5-minute observation period. No odour was detected during the remainder of the 5-minute observation period.

4.69 It was noted that this odour did not originate from Clitheroe WWTW and instead was from animals in the fields adjacent to the proposed development site.

4.70 The average odour intensity is calculated to be 0 'not perceptible', and in combination with the calculated odour pervasiveness/extent of 0% corresponds to a negligible overall odour exposure with reference to Table 15 of the IAQM guidance and a **negligible** odour effect when taking into account a receptor sensitivity of High.

Monitoring Location 27: Downwind of the WWTW

4.70.1 This location was monitored for five minutes at 11:55.

4.70.2 Odour was detected during the 5-minute survey period. The maximum odour intensity during the 5-minute observation period was scored at 2 'slight/weak'. The odour detected was 'Faecal/sludge' and 'Agricultural' in nature, with the offensiveness scored at -2 on the hedonic tone scale. The 'Faecal/sludge' odour was detected intermittently at intensity 2 'slight/weak' for a total of 60 seconds within the 5-minute observation period. The 'agricultural' odour was detected intermittently at intensity 1 'slight/very weak' for a total of 40 seconds within the 5-minute observation period. No odour was detected during the remainder of the 5-minute observation period.

4.70.3 It was noted that the 'Agricultural' odour did not originate from Clitheroe WWTW and instead was from animals in the fields adjacent to the proposed development site.

4.70.4 The average odour intensity for the 'Faecal/sludge' odour is calculated to be 0 'not perceptible', and in combination with the calculated odour pervasiveness/extent of 0% corresponds to a negligible overall odour exposure with reference to Table 15 of the IAQM guidance and a **negligible** odour effect when taking into account a receptor sensitivity of High.

Monitoring Location 28 - Downwind of the WWTW

4.71 This location was monitored for five minutes at 12:00.

4.72 Odour was detected during the 5-minute survey period. The maximum odour intensity during the 5-minute observation period was scored at 1 'slight/very weak'. The odour detected was 'Agricultural/Animal' in nature, with the offensiveness scored at -2 on the hedonic tone scale. The odour was detected intermittently at this intensity for a total of 60 seconds within the 5-minute observation period. No odour was detected during the remainder of the 5-minute observation period.

4.73 It was noted that this odour did not originate from Clitheroe WWTW and instead was from animals in the fields adjacent to the proposed development site.

4.74 The average odour intensity is calculated to be 0 'not perceptible', and in combination with the calculated odour pervasiveness/extent of 0% corresponds to a negligible

overall odour exposure with reference to Table 15 of the IAQM guidance and a **negligible** odour effect when taking into account a receptor sensitivity of High.

5 SITE VISIT 5 (25TH APRIL 2020)

Monitoring Location 1 – 5 – Upwind/Downwind of the WWTW

5.1 These locations were monitored for five minutes each between 12:45 and 13:20

5.2 No odour was detected during any of the 5-minute survey periods. As the odour was not perceptible, the odour effect is therefore deemed to be **negligible**.

Monitoring Location 6 - Downwind of the WWTW

5.3 This location was monitored for five minutes at 13:21.

5.4 Odour was detected during the 5-minute survey period. The maximum odour intensity during the 5-minute observation period was scored at 2 'slight/weak'. The odour detected was 'Agricultural/Animal' in nature, with the offensiveness scored at -2 on the hedonic tone scale. The odour was detected intermittently at intensity 1 #slight/very weak' for a total of 60 seconds, and at intensity 2 'slight/weak' for a total of 40 seconds within the 5-minute observation period. No odour was detected during the remainder of the 5-minute observation period.

5.5 It was noted that this odour did not originate from Clitheroe WWTW and instead was from animals in the fields surrounding the proposed development site.

5.6 The average odour intensity is calculated to be 1 'slight/very weak', and in combination with the calculated odour pervasiveness/extent of 0% corresponds to a negligible overall odour exposure with reference to Table 15 of the IAQM guidance and a **negligible** odour effect when taking into account a receptor sensitivity of High.

Monitoring Locations 7 - 16 - Downwind of the WWTW

5.7 These locations were monitored for five minutes each between 13:28 and 14:32.

5.8 No odour was detected during any of the 5-minute survey periods. As the odour was not perceptible, the odour effect is therefore deemed to be **negligible.**

Monitoring Location 17 - Downwind of the WWTW

5.9 This location was monitored for five minutes at 14:35.

5.10 Odour was detected during the 5-minute survey period. The maximum odour intensity during the 5-minute observation period was scored at 2 'slight/weak'. The odour

detected was 'Agricultural/Animal' in nature, with the offensiveness scored at -2 on the hedonic tone scale. The odour was detected intermittently at intensity 1 'slight/very weak' for a total of 20 seconds, and at intensity 2 'slight/weak' for a total of 60 seconds within the 5-minute observation period. No odour was detected during the remainder of the 5-minute observation period.

5.11 It was noted that this odour did not originate from Clitheroe WWTW and instead was from animals in the fields surrounding the proposed development site.

5.12 The average odour intensity is calculated to 1 'slight/very weak', and in combination with the calculated odour pervasiveness/extent of 0% corresponds to a negligible overall odour exposure with reference to Table 15 of the IAQM guidance and a **negligible** odour effect when taking into account a receptor sensitivity of High.

Monitoring Location 18 – 25 - Downwind of the WWTW

5.13 These locations were monitored for five minutes each between 14:40 and 15:28

5.14 No odour was detected during any of the 5-minute survey periods. As the odour was not perceptible, the odour effect is therefore deemed to be **negligible.**

Monitoring Location 26: Downwind of the WWTW

5.15 This location was monitored for five minutes at 15:30.

5.16 Odour was detected during the 5-minute survey period. The maximum odour intensity during the 5-minute observation period was scored at 3 'distinct'. The odour detected was 'Aeration (sweet)/Inlet works)' in nature, with the offensiveness scored at -3 on the hedonic tone scale. The odour was detected intermittently at intensity 2 'slight/weak' for a total duration of 20 seconds, and at intensity 3 'distinct' for a total of 35 seconds within the 5-minute observation period. No odour was detected during the remainder of the 5-minute observation period.

5.17 The average odour intensity is calculated to 1 'slight/very weak', and in combination with the calculated odour pervasiveness/extent of 0% corresponds to a negligible overall odour exposure with reference to Table 15 of the IAQM guidance and a **negligible** odour effect when taking into account a receptor sensitivity of High.

Monitoring Location 27 – 28 - Downwind of the WWTW

5.18 These locations were monitored for five minutes each between 15:35 and 15:45.

5.19 No odour was detected during any of the 5-minute survey periods. As the odour was not perceptible, the odour effect is therefore deemed to be **negligible.**

6 SITE VISIT 6 (24TH JUNE 2020)

Monitoring Location 1 – 12 – Upwind/Downwind of the WWTW

6.1 These locations were monitored for five minutes each between 11:45 and 13:01

6.2 No odour was detected during any of the 5-minute survey periods. As the odour was not perceptible, the odour effect is therefore deemed to be **negligible**.

Monitoring Location 13 - Downwind of the WWTW

6.3 This location was monitored for five minutes at 13:04.

6.4 Odour was detected during the 5-minute survey period. The maximum odour intensity during the 5-minute observation period was scored at 1 'slight/very weak'. The odour detected was 'Agricultural/Animal' in nature, with the offensiveness scored at -1 on the hedonic tone scale. The odour was detected intermittently at this intensity for a total of 60 seconds within the 5-minute observation period. No odour was detected during the remainder of the 5-minute observation period.

6.5 It was noted that this odour did not originate from Clitheroe WWTW and instead was from animals in the fields surrounding the proposed development site.

6.6 The average odour intensity is calculated to be 0 'not perceptible', and in combination with the calculated odour pervasiveness/extent of 0% corresponds to a negligible overall odour exposure with reference to Table 15 of the IAQM guidance and a **negligible** odour effect when taking into account a receptor sensitivity of High.

Monitoring Locations 14 - Downwind of the WWTW

6.7 This location was monitored for five minutes at 13:10.

6.8 No odour was detected during the 5-minute survey periods. As the odour was not perceptible, the odour effect is therefore deemed to be **negligible.**

Monitoring Location 15 - Downwind of the WWTW

6.9 This location was monitored for five minutes at 13:16.

6.10 Odour was detected during the 5-minute survey period. The maximum odour intensity during the 5-minute observation period was scored at 1 'slight/very weak'. The odour detected was 'Agricultural/Animal' in nature, with the offensiveness scored at -1 on the hedonic tone scale. The odour was detected intermittently at this intensity for a total of 20 seconds within the 5-minute observation period. No odour was detected during the remainder of the 5-minute observation period.

6.11 It was noted that this odour did not originate from Clitheroe WWTW and instead was from animals in the fields surrounding the proposed development site.

6.12 The average odour intensity is calculated to be 0 'not perceptible', and in combination with the calculated odour pervasiveness/extent of 0% corresponds to a negligible overall odour exposure with reference to Table 15 of the IAQM guidance and a **negligible** odour effect when taking into account a receptor sensitivity of High.

6.13 Monitoring Location 16 – 17 – Downwind/Upwind of the WWTW

6.14 These locations were monitored for five minutes each between 13:22 and 13:35.

6.15 No odour was detected during any of the 5-minute survey periods. As the odour was not perceptible, the odour effect is therefore deemed to be **negligible.**

Monitoring Location 18: Downwind of the WWTW

6.16 This location was monitored for five minutes at 13:35.

6.17 Odour was detected during the 5-minute survey period. The maximum odour intensity during the 5-minute observation period was scored at 1 'slight/very weak'. The odour detected was 'Agricultural/Animal' in nature, with the offensiveness scored at -1 on the hedonic tone scale. The odour was detected intermittently at this intensity for a total of 40 seconds within the 5-minute observation period. No odour was detected during the remainder of the 5-minute observation period.

6.18 It was noted that this odour did not originate from Clitheroe WWTW and instead was from animals in the fields surrounding the proposed development site.

6.19 The average odour intensity is calculated to be 0 'not perceptible', and in combination with the calculated odour pervasiveness/extent of 0% corresponds to a negligible overall odour exposure with reference to Table 15 of the IAQM guidance and a **negligible** odour effect when taking into account a receptor sensitivity of High.

Monitoring Locations 19 - Downwind of the WWTW

6.20 This location was monitored for five minutes at 13:37.

6.21 No odour was detected during the 5-minute survey periods. As the odour was not perceptible, the odour effect is therefore deemed to be **negligible.**

Monitoring Location 20: Downwind of the WWTW

6.22 This location was monitored for five minutes at 13:45.

6.23 Odour was detected during the 5-minute survey period. The maximum odour intensity during the 5-minute observation period was scored at 3 'distinct'. The odour detected

was ‘Sludge’ in nature, with the offensiveness scored at -3 on the hedonic tone scale. The odour was detected intermittently at this intensity for a total of 10 seconds within the 5-minute observation period. No odour was detected during the remainder of the 5-minute observation period.

6.24 The average odour intensity is calculated to be 0 ‘not perceptible’, and in combination with the calculated odour pervasiveness/extent of 0% corresponds to a negligible overall odour exposure with reference to Table 15 of the IAQM guidance and a **negligible** odour effect when taking into account a receptor sensitivity of High.

Monitoring Location 21 – 23 - Downwind of the WWTW

6.25 These locations were monitored for five minutes each between 13:55 and 14:16.

6.26 No odour was detected during any of the 5-minute survey periods. As the odour was not perceptible, the odour effect is therefore deemed to be **negligible.**

Monitoring Location 24: Downwind of the WWTW

6.27 This location was monitored for five minutes at 14:17.

6.28 Odour was detected during the 5-minute survey period. The maximum odour intensity during the 5-minute observation period was scored at 1 ‘slight/very weak’. The odour detected was ‘Faecal/Sludge’ in nature, with the offensiveness scored at -2 on the hedonic tone scale. The odour was detected intermittently at this intensity for a total of 30 seconds within the 5-minute observation period. No odour was detected during the remainder of the 5-minute observation period.

6.29 The average odour intensity is calculated to be 0 ‘not perceptible’, and in combination with the calculated odour pervasiveness/extent of 0% corresponds to a negligible overall odour exposure with reference to Table 15 of the IAQM guidance and a **negligible** odour effect when taking into account a receptor sensitivity of High.

Monitoring Location 25: Downwind of the WWTW

6.30 This location was monitored for five minutes at 14:25.

6.31 Odour was detected during the 5-minute survey period. The maximum odour intensity during the 5-minute observation period was scored at 2 ‘slight/weak’. The odour detected was ‘Faecal/Sludge’ in nature, with the offensiveness scored at -2 on the hedonic tone scale. The odour was detected intermittently at intensity 1 ‘slight/very weak’ for a total of 30 seconds, and at intensity 2 ‘slight/weak’ for a total of 40 seconds within the 5-minute observation period. No odour was detected during the remainder of the 5-minute observation period.

6.32 The average odour intensity is calculated to be 0 'not perceptible', and in combination with the calculated odour pervasiveness/extent of 0% corresponds to a negligible overall odour exposure with reference to Table 15 of the IAQM guidance and a **negligible** odour effect when taking into account a receptor sensitivity of High.

Monitoring Location 26: Downwind of the WWTW

6.33 This location was monitored for five minutes at 14:35.

6.34 Odour was detected during the 5-minute survey period. The maximum odour intensity during the 5-minute observation period was scored at 3 'distinct'. The odour detected was 'Aeration (Sweet)/Faecal/Sludge' in nature, with the offensiveness scored at -2 on the hedonic tone scale. The odour was detected intermittently at intensity 1 'slight/very weak' for a total of 30 seconds, at intensity 2 'slight/weak' for a total of 40 seconds, and at intensity 3 'distinct' for a total of 10 seconds within the 5-minute observation period. No odour was detected during the remainder of the 5-minute observation period.

6.35 The average odour intensity is calculated to be 1 'slight/very weak', and in combination with the calculated odour pervasiveness/extent of 0% corresponds to a negligible overall odour exposure with reference to Table 15 of the IAQM guidance and a **negligible** odour effect when taking into account a receptor sensitivity of High.

Monitoring Location 27: Downwind of the WWTW

6.36 This location was monitored for five minutes at 14:42.

6.37 Odour was detected during the 5-minute survey period. The maximum odour intensity during the 5-minute observation period was scored at 3 'distinct'. The odour detected was 'Faecal' in nature, with the offensiveness scored at -2 on the hedonic tone scale. The odour was detected intermittently at intensity 2 'slight/weak' for a total of 30 seconds, and at intensity 3 'distinct' for a total of 10 seconds within the 5-minute observation period. No odour was detected during the remainder of the 5-minute observation period.

6.38 The average odour intensity is calculated to be 0 'not perceptible', and in combination with the calculated odour pervasiveness/extent of 0% corresponds to a negligible overall odour exposure with reference to Table 15 of the IAQM guidance and a **negligible** odour effect when taking into account a receptor sensitivity of High.

Monitoring Locations 28 - Downwind of the WWTW

6.39 This location was monitored for five minutes at 14:48.

6.40 No odour was detected during the 5-minute survey periods. As the odour was not perceptible, the odour effect is therefore deemed to be **negligible.**

Appendix D
Odour Acuity Certificate

8 Vale View
Vicarage Lane, Bowdon
Altrincham, Cheshire, WA14 3BD
Phone 0161 929 6778
uk@odournet.com
Companies House Cardiff 2900894

Acuity Test Certificate

Organisation	Wardell Armstrong-Leigh
Contact	Paul Threlfall
Address	2 The Avenue
	Leigh
	UK
	WN7 1FS
Telephone	01942 260101
Participant Name	Paul Threlfall
Date	30th September 2019

Criteria Assessed	Acceptable Range	Participants Results
Average of ITE (10^{YITE})	$20 \leq 10^{YITE} \leq 80$	62.26
Standard deviation of ITE (10^{SITE})	$10^{SITE} \leq 2.3$	2.25

Participants Acuity Result	Qualified

Result clarification: Assessor Paul Threlfall qualified as a panel member as his sensitivity to the reference material n-butanol fell within the defined bandwidth according to BSEN 13725 guidelines; also the repeatability of his responses resulted in a standard deviation that was below the limit specified.

Acuity testing was carried out in accordance with standard BSEN 13725:2003 'Air quality – Determination of odour concentration by dynamic olfactometry'. The test was carried out over one day, which is the only variation to the standard.

Holly Dawson
Laboratory Manager

Appendix E
Odour Concentration Maps

KEY

Site Boundary

Odour Concentration

- 1.5
- 3
- 5
- 10

Notes:

Boundaries are indicative. Aerial imagery shown for context purposes only.

REVISION	DETAILS	DATE	DRAWN	CHK'D	APP'D

CLIENT

GLADMAN DEVELOPMENTS LTD

PROJECT

HENTHORN ROAD, CLITHEROE

DRAWING TITLE

2020 ODOUR CONTOUR PLOTS POST MITIGATION

DRG No.	REV	SUIT. CODE
GM13551-002	A	--

DRG SIZE	SCALE	DATE
A3	1:5,000	09/12/2025

DRAWN BY	CHECKED BY	APPROVED BY
CT	PT	MTW

wardell armstrong
PART OF SLR

\\slr.local\eu\Offices\UK\WA\Projects\GM\GM13551 - Henthorne Road Clitheroe\03 - Design\GIS\GM13551-002 2020 Odour Contour Plots Post Mitigation\GM13551-002 2020 Odour Contour Plots Post Mitigation.aprx