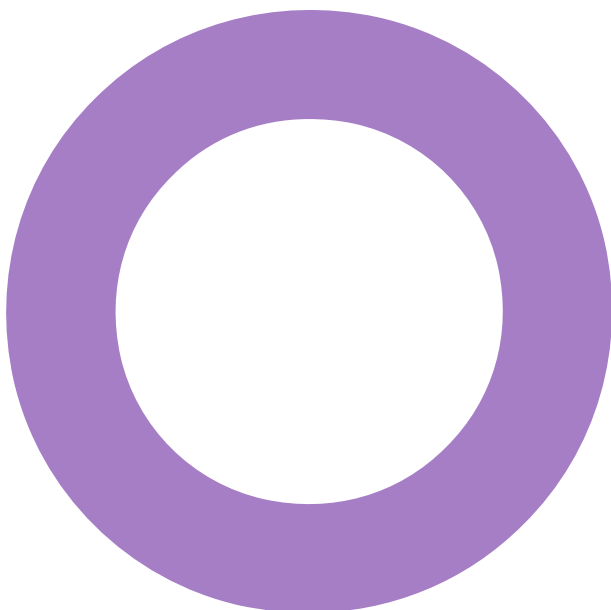


Land at Ford Airfield. Ford, West Sussex. Redrow Homes Southern and Wates Developments Ltd.

AIR QUALITY

CUMULATIVE ODOUR IMPACT ASSESSMENT FOR BESMOKE LTD,
WICKS FARM BIOGAS DIGESTOR AND GRUNDON WASTE TRANSFER
STATION

REVISION 03 – 24 NOVEMBER 2020



Audit sheet.

Rev.	Date	Description of change / purpose of issue	Prepared	Reviewed	Authorised
01	18/11/2020	First Draft	CS	CR/CH	CR
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CUMULATIVE ODOUR IMPACT
ASSESSMENT FOR BESMOKE LTD,
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Executive summary.

Hoare Lea has been commissioned by Redrow Homes and Wates Developments Ltd to undertake a Cumulative Odour Impact Assessment in support of a planning application for a Proposed Development at Ford Airfield, Ford, West Sussex (the 'Application Site') (ref. F/4/20/OUT).

The proposals comprise the development of the Application Site to provide up to 1,500 residential units, a 60-bed care home, 9,000 sqm of employment floorspace, a local centre, a two-form entry primary school and associated facilities, landscaping and infrastructure.

The Cumulative Odour Impact Assessment has been undertaken at the request of Arun District Council, to assess the potential for odour impacts on the Proposed Development from Besmoke Ltd, a foodstuff smoking facility, the Wicks Farm biogas digester and the Grundon Waste Transfer Station.

A series of Field Odour Surveys or 'Sniff Tests', following the methodology set out by the Institute of Air Quality Management, have been undertaken on four separate days to determine whether there is potential for odour effects at the Proposed Development. During the site visits, it was confirmed that the biogas digester at Wicks Farm had not yet been constructed.

The Field Odour Surveys for Besmoke Ltd were undertaken when the wind was blowing from the north, north-east and east, that is the conditions when residential areas of the Proposed Development will be downwind. The odour effect is considered to be negligible. This combined with the small number of unsubstantiated odour complaints, provided by ADC, it is considered unlikely that there will be significant odour effects from Besmoke Ltd at the Proposed Development.

With regards to the Wicks Farm biogas digester, a review of the documents submitted as part of the planning application (West Sussex County Council planning ref: WSCC/026/16/F) for this scheme indicates that there is the potential for occasional slight adverse impacts during its operation. However, in order to protect the amenity of residents, an Odour Management Plan will be required at the facility. Furthermore, the potential for odour impacts from the proposed lagoon were considered to be negligible. When considering the potential low magnitude of the emission source, the distance from the residential units at the Proposed Development and the frequency of wind blowing in the direction of the Proposed Development, the potential for odour impacts from the Wicks Farm biogas digester is considered to be negligible.

The Grundon Waste Management Station facility does not appear to be operating in line with its Environmental Permit. The planning system requires it to be assumed that the Environmental Permitting Regime is effective at controlling pollution, including odour. When operating in conformity with its Environmental Permit the odour effects are considered to be negligible and as such, unlikely to lead to cumulative impacts at the Proposed Development.

Due to the locations of Besmoke Ltd, Wicks Farm biogas digester and the Grundon Waste Transfer Station, the proposed residential properties are downwind of each facility when the wind is blowing in different directions. As such no single residential property at the Application Site will be able to experience odour from all three facilities at the same time. Furthermore, the potential odour impacts from Besmoke Ltd and Wicks Farm biogas digester and lagoon are considered negligible. For the Grundon Waste Transfer Station, when operating in compliance with the Environmental Permit, the odour impacts are also considered to be negligible.

Based on this report, it is concluded that the potential cumulative odour impacts at the Proposed Development from Besmoke Ltd, the Wicks Farm biogas digester and lagoon and the Grundon Waste Transfer Station will be negligible and will not lead to significant cumulative impacts at the Proposed Development.

1. Introduction.

Hoare Lea has been commissioned by Redrow Homes and Wates Developments Ltd to undertake a Cumulative Odour Impact Assessment from Besmoke Ltd, a foodstuff smoking facility, Wicks Farm biogas digester and the Grundon Waste Management Transfer Station in support of a planning application for a Proposed Development at Ford Airfield, Ford, West Sussex (the 'Application Site') (ref. F/4/20/OUT).

The Proposed Development comprises the development of up to 1,500 dwellings (Use Class C3), 60-bed care home (Use Class C2), up to 9,000 sqm of employment floorspace (Use Classes B1), local centre of up to 2,350 sqm including up to 900 sqm retail / commercial (Use Classes A1-A5) and 1,450 sqm community / leisure floorspace (Use Classes D1-D2), land for a two-form entry primary school (Use Class D1), public open space, allotments, new sports pitches and associated facilities, drainage, parking and associated access, infrastructure, landscape, ancillary and site preparation works, including demolition of existing buildings and part removal of existing runway hardstanding

1.1 Background.

The Application Site predominately comprises land formerly in use as an airfield. Large areas of the site now comprise agricultural land separated by hedgerows and trees however there are existing receptors including the Flying Fortress play centre and the Arun Sports Area which are located centrally within the airfield. Furthermore, parts of the old runway are used as an outdoor market and car boot sale area typically twice a week.

As part of ongoing consultation following submission of the Ford Airfield planning application with Fiona Fitzgerald, Senior Environmental Health Officer (EHO) at Arun District Council (ADC) it was requested that a Cumulative Odour Impact Assessment was undertaken to determine the potential for odour impacts at the Proposed Development associated with Besmoke Ltd, a foodstuff smoking facility located at the Ford Industrial Park, adjacent to the Proposed Development, the Wicks Farm biogas digester, located at land off Ford Lane to the north of the Proposed Development and the Grundon Waste Transfer Station, located within the Ford Circular Technology Park to the immediate east of the Proposed Development. This consultation is detailed within Appendix 1 and the location of the Application Site in relation to Besmoke Ltd, Wicks Farm biogas digester and the Grundon Waste Transfer Station is provided in Figure 1.



Figure 1: Application Site, Besmoke Ltd, Wicks Farm biogas digester and Grundon Waste Transfer Station Locations. Contains OS Data © Crown Copyright and Database rights 2020

1.2 Scope of Assessment.

Prior to the commencement of the air quality assessment for the Proposed Development, submitted as part of the planning application (ADC ref: F/4/20/OUT), Colin Giddings, former EHO at ADC, was consulted in May 2018 regarding the assessment and a scoping report was issued. Besmoke Ltd and Wicks Farm biogas digester were not identified as potential odour sources requiring inclusion in the assessment and it was confirmed that no odour complaints had been received regarding the Grundon Waste Transfer Station. As such, these facilities were not considered as part of the submitted Air Quality and Odour ES Chapter or the submitted Odour Impact Assessment Technical Appendix (ref: REP-1010502-5A-20200218-Ford Airfield Odour-R5).

The scope of this Cumulative Odour Impact Assessment was provided via email to Fiona Fitzgerald, on the 9th October 2020 following an earlier telephone conversation that agreed that a qualitative assessment and sniff tests would be undertaken to assess the potential for cumulative odour impacts at the Application Site. The scope of the assessment that was provided is as follows:

- Review odour complaint history;
- Review operational information for both facilities;
- Undertake a series of sniff tests at the Application Site in the vicinity of the facilities in line with the methodology detailed in the Institute of Air Quality Management (IAQM) document 'Guidance on the assessment of odour for planning'¹;
- Undertake a qualitative cumulative odour assessment in line with the methodology detailed in the IAQM guidance¹ as a stand-alone technical assessment.

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We acknowledge that sniffs tests are not typically undertaken at this time of year; the preferred season for sniff tests is April to September. However, for industrial processes such as those at Besmoke Ltd, the outside temperature does not have an influence on the odour intensity and therefore it is reasonable to undertake sniff tests all year round. This was discussed via telephone with the EHO and a copy of the email correspondence with ADC has been included in Appendix 1.

2. Odour Background.

2.1 Odour Definition.

The Department for Environment, Food and Rural Affairs (Defra) withdrawn guidance² describes odour as:

“Odours may be perceived as pleasant or unpleasant. The main concern with odour is its ability to cause a response in individuals that is considered to be objectionable or offensive.

[...]

Whilst there is often agreement about what constitutes pleasant and unpleasant odours, there is a wide variation between individuals as to what is deemed unacceptable and what affects our quality of life.”

The IAQM guidance¹ recognises the subjective nature of odour and notes that “most odours are mixtures of many chemicals to produce what we detect as a smell.” Distinctions should be made between what is considered to be “odour-free” air i.e. air that contains no odourous chemicals and “fresh-air” which is perceived to have no unpleasant odourous chemicals but may in fact contain odours which are pleasant in character e.g. freshly mown grass.

2.1 Odour Nuisance Regulation.

2.1.1 Statutory Nuisance

Odour emissions from premises are typically controlled through the Environmental Permitting (England and Wales) Regulations (2007), and subsequent amendments or by the Statutory Nuisance provisions in Section 79 of Part III of the Environmental Protection Act (1990). Statutory nuisance is defined for the purposes of the 1990 Act and includes:

“any dust steam, smell or other effluvia arising on industrial trade or business premises and being prejudicial to health or a nuisance.”

Enforcement of the statutory nuisance provisions under the Act is by the local authority, whose officers are required to provide an independent evaluation of whether there is a nuisance or not. If the Local Authority (LA) is satisfied that a statutory nuisance exists or is likely to occur or reoccur, it must serve an abatement notice. The Local Authority can insist that there be no malodour beyond the boundary of the premises where odour generating activities are taking place. A defence is to show that the process causing the nuisance is being controlled using Best Practicable Means.

2.2 Environmental Permitting.

Facilities which require an Environmental Permit to operate are expected to operate using Best Available Techniques to minimise emissions and impacts on the environment. It is understood that neither Besmoke Ltd nor Wicks Farm biogas digester has an Environmental Permit however the Grundon Waste Transfer Station does (permit ref: EPR/DB3304HB).

2.3 Planning Policy.

2.3.1 National Planning Policy Framework.

The National Planning Policy Framework (NPPF) 2019³ sets out planning policy for England and how these are expected to be applied. Relevant sections are set out below:

Paragraph 54: “Local planning authorities should consider whether otherwise unacceptable development could be made acceptable through the use of conditions or planning obligations. Planning obligations should only be used where it is not possible to address unacceptable impacts through a planning condition.”

- Paragraph 170: “Planning policies and decisions should contribute to and enhance the natural and local environment by: preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality”
- Paragraph 180: “Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development.”
- Paragraph 183: “The focus of planning policies and decisions should be on whether proposed development is an acceptable use of land, rather than the control of processes or emissions (where these are subject to separate pollution control regimes). Planning decisions should assume that these regimes will operate effectively. Equally, where a planning decision has been made on a particular development, the planning issues should not be revisited through the permitting regimes operated by pollution control authorities.”

The NPPF is supported by Planning Practice Guidance (PPG).

The PPG on air quality states that:

Paragraph 001 (Reference ID: 32-001-20140306): “Odour and dust can also be a planning concern, for example, because of the effect on local amenity.”

Paragraph 005 (Reference ID: 32-005-20140306): “When deciding whether air quality is relevant to a planning application, considerations could include whether the development would [...] Expose people to existing sources of air pollutants. This could be by building new homes, workplaces or other development in places with poor air quality.”

It should be noted that planning policy requires that general amenity should be taken into account and that loss of amenity does not equate directly to nuisance. It is often the case that loss of amenity occurs at much lower levels of odour exposure than what would be considered as a statutory nuisance.

The PPG also sets out the information that may be required in an air quality assessment, stating that:

Paragraph 007 (Reference ID: 32-007-20140306): “Assessments should be proportional to the nature and scale of development proposed and the level of concern about air quality, and because of this are likely to be locationally specific.”

It also provides guidance on options for mitigating air quality impacts, and makes clear that:

Paragraph 008 (Reference ID: 32-008-20140306): “Mitigation options where necessary will be locationally specific, will depend on the Proposed Development and should be proportionate to the likely impact.”

2.4 Arun District Council Local Plan.

The Arun Local Plan 2011-2031⁴, adopted in July 2018, sets out the planning framework for the district for the period between 2011 and 2031. The following policy is relevant to this assessment:

“Policy QE SP1 Quality of the Environment

The Council requires that all development contributes positively to the quality of the environment and will ensure that development does not have a significantly negative impact upon residential amenity, the natural environment or upon leisure and recreational activities enjoyed by residents and visitors to the District.

The location of existing industrial and commercial uses, including waste management uses, must be taken into consideration when assessing proposals for development sensitive to noise, light, odour and outputs to air. This is to ensure that land allocated for these uses are protected and to ensure that the amenity of new developments and facilities is safeguarded from the impacts of incompatible land uses."

Besmoke Ltd and Grundon Waste Management facility are existing premises. The Wick Farm biogas digester is a consented waste management facility. All three facilities have been considered as part of this Cumulative Odour Impact Assessment in line with the requirements of Policy QE SP1.

2.5 Guidance Documents.

2.5.1 Guidance on the Assessment of Odour for Planning.

The IAQM document 'Guidance on the Assessment of Odour for Planning'¹ provides guidance for practitioners involved in odour assessments for planning purposes to determine potential amenity impacts.

To facilitate the assessment of the significance of predicted odour exposure on amenity, the guidance defines receptor sensitivity and proposes 'odour effect descriptors' which combine the relative sensitivity of the receptors with, the nature (or offensiveness) of the odour. Table 1 presents the IAQM guidance¹ for defining the odour sensitivity of different types of receptor.

Table 1: Receptor Sensitivity to Odour

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

2.5.2 Odour Impacts

The magnitude of odour impacts depends on a number of factors and the potential for complaints to occur varies due to the subjective nature of odour perception. The factors affecting odour perception, known as FIDOL, are:

- Frequency – how often the odour occurs;
- Intensity – the perception of the strength of the odour;
- Duration – how much time the odour occurs for;

- Odour unpleasantness – whether an odour is pleasant, neutral or unpleasant; and
- Location – the sensitivity of land use and the nature of human activities in the vicinity of the odour.

The probability of disamenity will be dependent upon the inter-relationship between these factors. For example, a less frequent but higher offensiveness odour may (or may not) be more problematic than a more frequent but less offensive odour dependent upon the duration of exposure.

The IAQM guidance¹ suggests that, where possible, 'multi-tool odour assessment' of site suitability should be applied:

- Monitoring (e.g. sniff tests) can give a measure of odour at specific locations under the conditions prevailing at the times and days of the sampling, but cannot cover all receptor locations under every meteorological condition over a typical year;
- Complementing monitoring with dispersion modelling provides greater spatial and temporal coverage and the reasonableness of the estimates from the model can be compared with the observed (i.e. monitored) levels; and
- Modelling (and probably monitoring) is only likely to characterise normal operations of the odour source, whereas it is known that unexpected events (e.g. breakdowns) and abnormal operations at some facilities can account for a significant proportion of high odour episodes. If there are already receptors in the locality, analysis of historical complaints data can provide an alternative perspective on the impact that is inclusive of such unexpected events and abnormal operations.

3. Methodology.

The Cumulative Odour Impact Assessment includes three phases:

- Baseline odour assessment including a review of most recent available complaint history data;
- Field Odour Surveys; and
- Cumulative odour impact assessment.

The methodologies for the Field Odour Survey and cumulative odour impact assessment are outlined below.

3.1 Field Odour Survey.

3.1.1 Field Odour Survey Periods

Field Odour Surveys were undertaken over the following periods:

- 14th and 15th October 2020; and
- 6th and 7th November 2020.

Each survey involved a series of sniff tests at locations across the Application Site in order to determine the potential for odour impacts from existing sources at the Proposed Development. The draft land use plan, provided by Barton Willmore in October 2020 (ref: 23885-RG-M-78S – Illustrative Master Plan-1-2500A) was utilised to determine the extent of the Application Site and to identify the locations where residential properties are proposed and therefore where odour there may be an odour effect, depending on the wind direction on each survey day.

The sniff tests for Besmoke Ltd were undertaken along transects in the central (locations C1, C2 and C3) and western (locations W1, W2 and W3) parts of the parcel of land to the north of the facility where residential properties are proposed, starting at points furthest away and moving towards the odour source. Sniff tests were also undertaken along a transect to the south (locations S1 and S2) of Besmoke Ltd, in the parcel of land to the south of Rollaston Road where residential receptors are also proposed. Sniff tests were undertaken at locations along each transect at varying distances from Besmoke Ltd and are illustrated in Figure 2 below.



Figure 2: Sniff Test Locations for Besmoke Ltd. Contains OS Data © Crown Copyright and Database rights 2020.

Each sniff test was of five minutes duration. Wind direction was determined prior to each site visit using meteorological forecasts for the area of Ford from Yr⁵, from the Norwegian Meteorological Institute and then recorded on site using the compass app on an iPhone. Wind speed and temperature were recorded using a hand-held anemometer at head height (approximately 1.6m from ground).

To further assist in recording the wind speeds, the Beaufort scale has been utilised (see Appendix 2). The cloud cover was determined visually using oktas (i.e. 1 okta is when $\frac{1}{8}$ of the sky is covered by cloud and 8 oktas is when the sky is completely covered by cloud).

The Field Odour Survey forms completed during the sniff tests are in Appendix 3.

3.1.2 IAQM Guidance – Sniff Testing

Monitoring was undertaken using the human nose as the analytical sensor to enable the odour magnitude (intensity), frequency, duration and offensiveness of the odour to be recorded at each location at a specific time. This is considered to be a sound approach as it allows the character of the odour to be assessed which is beneficial when there are a number of different odour sources. Furthermore, the assessor has successfully completed odour acuity testing following EN: 13725:2003 and a copy of this certificate is provided in Appendix 7.

In order to determine the potential odour exposure impacts at the Proposed Development, odour intensity was recorded over a five minute period at 10 second intervals at locations downwind of the potential odour sources (30 samples in total).

In the absence of a UK standard method for undertaking subjective sniff tests the German standard Verein Deutscher Ingenieure (VDI) 3940⁶ has been utilised in this assessment. The VDI standard intensity (I) scale ranges

from 0 (no odour) through to 6 (extremely strong) and the table provided in the IAQM guidance¹ detailing the scale is shown in Table 2 below.

Table 2: VDI 3490 Odour Intensity Scale (Table 13 of the IAQM guidance¹)

Odour Strength	Intensity Level	Comments
No odour/not perceptible	0	No odour when compared to a clean site
<i>The Odour Detection Threshold (ODT) of 1 ouE/m³ is somewhere between 0 and 1</i>		
Slight/very weak	1	There is probably some doubt to as whether the odour is actually present
Slight/weak	2	The odour is present but cannot be described using precise words or terms
Distinct	3	The odour character is barely recognisable
<i>VDI 3940 says that the recognition threshold intensity is generally 3-10 times higher than the ODT (i.e. 3-10 ouE/m³)</i>		
Strong	4	The odour character is easily recognisable
Very strong	5	The odour is offensive. Exposure to this level would be considered undesirable
Extremely Strong	6	The odour is offensive. An instinctive reaction would be to mitigate

The IAQM guidance¹ has provided an example of how the VDI odour intensity scale can be used in a subjective sniff test. Further information on the sniff test methodology is provided in Appendix 4.

The results of the sniff test are then interpreted to assess the odour impact at each location. The odour exposure experienced is dependent on different combinations of the FIDOL factors and can result in variations in odour exposure. Table 3 has been taken from the IAQM guidance¹ and shows how intensity, frequency and duration can be considered together to determine odour exposure. Only odour intensity scores greater than or equal to 4 should be considered when determining the odour extent at the survey locations (t₁₂₄). This is because a score of 4 means the odour character is easily recognisable as occurring from the odour sources in question and cannot be attributed to any other odour source.

Table 3: Matrix to Assess Odour Exposure (Table 14 of IAQM guidance¹)

Average Intensity (I _{mean})		Percentage Odour Time (t ₁₂₄) during Survey Period				
		≤10%	11 to 20%	21 to 30%	31 to 40%	≥41%
	6	Large	Very Large	Very Large	Very Large	Very Large
	5	Medium	Large	Large	Very Large	Very Large
	4	Small	Medium	Medium	Large	Large
	3	Small	Medium	Medium	Medium	Medium
	2	Small	Small	Medium	Medium	Medium
	1	Small	Small	Small	N/A	N/A

It should be noted that the matrix in Table 3 should only be used for neutral or unpleasant odours as research suggests there is no significant difference between the annoyance potential of unpleasant or neutral odours. Pleasant odours however, have a significantly lower annoyance potential at the same intensity.

The IAQM guidance states intensity mean (I_{mean}) should be rounded to the nearest whole number and where the intensity mean is calculated to be 0, the odour impact can be considered as negligible. Similarly, if the percentage of time in which odour with an intensity score of greater than or equal to 4 is calculated to be 0%, the odour effect can also be considered as negligible.

3.2 Odour Impact Assessment.

The odour impact assessment has been undertaken based on the odour intensity results of the Field Odour Surveys. The overall odour exposure at each survey location and the sensitivity of the proposed land-use has then been combined to predict the odour impact at each survey location. The IAQM guidance¹ provides a matrix for determining the odour impact which has been presented in Table 4 below.

Table 4: Matrix to Assess the Odour Impact at Individual Receptors (Table 15 of the IAQM guidance¹)

		Receptor Sensitivity		
		Low	Medium	High
Overall Odour Exposure	Very Large	Substantial adverse	Substantial adverse	Substantial adverse
	Large	Moderate adverse	Moderate adverse	Substantial adverse
	Medium	Slight adverse	Slight adverse	Moderate adverse
	Small	Negligible	Negligible	Slight adverse

Prevailing meteorological conditions at the Application Site, complaints records and the nature of the relevant odour sources have also been considered when determining the overall cumulative odour impact at the Proposed Development.

The assessment utilised professional judgement to consider potential constraints to the proposed Application Site end use and the experience of those involved in the preparation of the assessment are provided in Appendix 6.

4. Baseline Conditions.

4.1 Description of Potential Odour Sources.

4.1.1 Besmoke Ltd

Besmoke Ltd is located within the Ford Airfield Industrial Park located immediately west of the Ford Airfield off Rollaston Park. As part of the Proposed Development, the existing fields located to the north, east and south of the Ford Airfield Industrial Park will become residential areas. There are existing residential properties located approximately 100m to the west of Besmoke Ltd.

As part of the baseline assessment, Hoare Lea contacted Besmoke Ltd in order to obtain information regarding their on-site operations. A response was received via email from Mr Huw Griffiths, Founder and CEO of Besmoke Ltd, who provided the following operational information:

- The facility operates 24 hours a day, 7 days a week and all year round;
- Foodstuffs are smoked with woodchip and occasionally charcoal within enclosed chambers which are vented to air via a ventilation system;
- There are no odour control measures as the facility uses a natural smoke process; and
- The process does not generate large, thick volumes of smoke however the “thin wisp of smoke” is continuous.

In addition, it was confirmed via email from ADC that Besmoke Ltd do not currently hold an environmental permit.

4.1.2 Wicks Farm Biogas Digester

It is understood that the proposed biogas digester at Wicks Farm, located at land off Ford Lane, has been granted planning permission (West Sussex County Council planning ref: WSCC/019/17/F) but has not yet been constructed. This was confirmed when attending the site to undertake the sniff tests as no biogas digester was visible. As such, information from the planning application for the biogas digester has been utilised to determine the potential for odour impacts from the biogas digester.

4.1.3 Grundon Waste Transfer Station

The Grundon Waste Transfer Station is located within the Ford Circular Technology Park, located immediately east of the Ford Airfield. As part of the Proposed Development, the existing fields to the west and north west of the Ford Circular Technology Park will become residential areas. The closest existing residential properties to the Ford Circular Technology Park are approximately 220m to the north-east off Ford Lane.

From the signage located at the entrance to the Ford Circular Technology Park, it is understood that the Grundon Waste Transfer Station operates during the following hours:

- Monday to Friday: 07:00 – 16:30; and
- Saturday: 07:00 – 11:30.

From a review of the documents available on the West Sussex County Council (WSCC) planning portal, there is an extant consent (WSCC/096/13/F) for a thermal waste treatment plant, including a Materials Recycling Facility and Residual Waste Treatment building; the extent to which this consent has been implemented is not known, however it could be built out at any time. In that event, Condition 31 in the decision notice (ref: WSCC/096/13/F) secures the facility must operate under a negative pressure and keep the doors closed when reasonably practicable.

Notwithstanding the above condition, and more importantly, the existing use of the Ford Circular Technology Park is subject to an Environmental Permit which with regards to odour, states:

"Emissions from the activities shall be free from odour at levels likely to cause pollution outside the site, as perceived by an authorised officer of the Environment Agency, unless the operator has used appropriate measures, including, but not limited to those specified in any approved odour management plan, to prevent or where that is not practicable, to minimise, the odour."

The Environment Agency confirmed, via email dated 13th January 2020, that the Grundon Waste Transfer Station does not have an odour management plan.

NPPF paragraph 183 (as detailed in Section 2.3) makes it clear that planning decisions should assume that the Environmental Permitting regime will operate effectively. In this case this means the Environment Agency is the regulator responsible for controlling any odour from the existing Waste Transfer Station. Should the extant planning consent for the Materials Recovery Facility and Residual Waste Treatment building be implemented in the future, the planning condition detailed above would also apply. This requires the facility to operate under negative pressure and keep doors closed where reasonably practicable.

4.2 Complaint Records.

The number of complaints received in response to odour emissions from a site can be a useful tool in assessing the level of impact to the surrounding community. However, it should be noted that a lack of complaints should not be viewed as confirmation that effects are not experienced. Over time, people may become accustomed to a certain level of odour that they may feel as 'normal' whereas a new resident may view the impacts as unacceptable as they have not been exposed to these in the past.

Details of the complaints data available and utilised is provided in the subsections below.

4.2.1 Besmoke Ltd

An odour complaints history for Besmoke Ltd was provided by ADC in January 2020 with more recent complaint data provided in October 2020.

The odour complaints history shows that ten complaints were received between October 2018 and July 2020 of which six were undefined nuisance complaints. It is unclear whether these nuisance complaints were related to odour or other issues. There are two complaints regarding dark smoke emissions, one on air quality and one on fumes/gases. None of these complaints were specifically related to odour from the facility. It is understood that none of the complaints have been substantiated by ADC.

4.2.2 Wicks Farm Biogas Digestor

As the Wicks Farm biogas digestor is currently not operational, there are no odour complaints associated with this facility.

4.2.3 Grundon Waste Transfer Station

An odour complaints history for Grundon Waste Transfer Station was provided by ADC in November 2020 and shows that eight complaints were received between August 2016 and July 2020 of which one request was an undefined nuisance complaint. The remaining complaints were in relation to noise, pest control and information requests. It is unclear whether the nuisance complaint was related to odour or other issues however this complaint has a completion date of the 9th September 2020. No other complaints have been received since July 2020 according to the information provided by ADC.

4.3 Prevailing Wind Direction.

The potential for odour to impact on the Proposed Development depends significantly on the local weather conditions and in particular, the wind direction. The closest meteorological station to Ford is located at Shoreham, approximately 20km east of the Proposed Development. ADC was consulted regarding the suitability of using

the Shoreham data during the initial consultation for the planning application and has confirmed that this is their preferred meteorological data set for the Application Site due to proximity and height of ground level (mAoD).

The wind rose for Shoreham for a five-year period (2013-2017) is illustrated in Figure 3 and shows that the prevailing wind direction is from the south west with a strong northerly component attributable to coastal effects. This is as expected given the lack of topographical influence in this area.

It should be noted that although sensitive land uses (i.e. residential use) are proposed in all directions across the Application Site, it should be noted that future residents will not be present at all locations all of the time; a potential odour effect from the facilities can only occur when the wind is blowing from one of the facilities to a receptor.

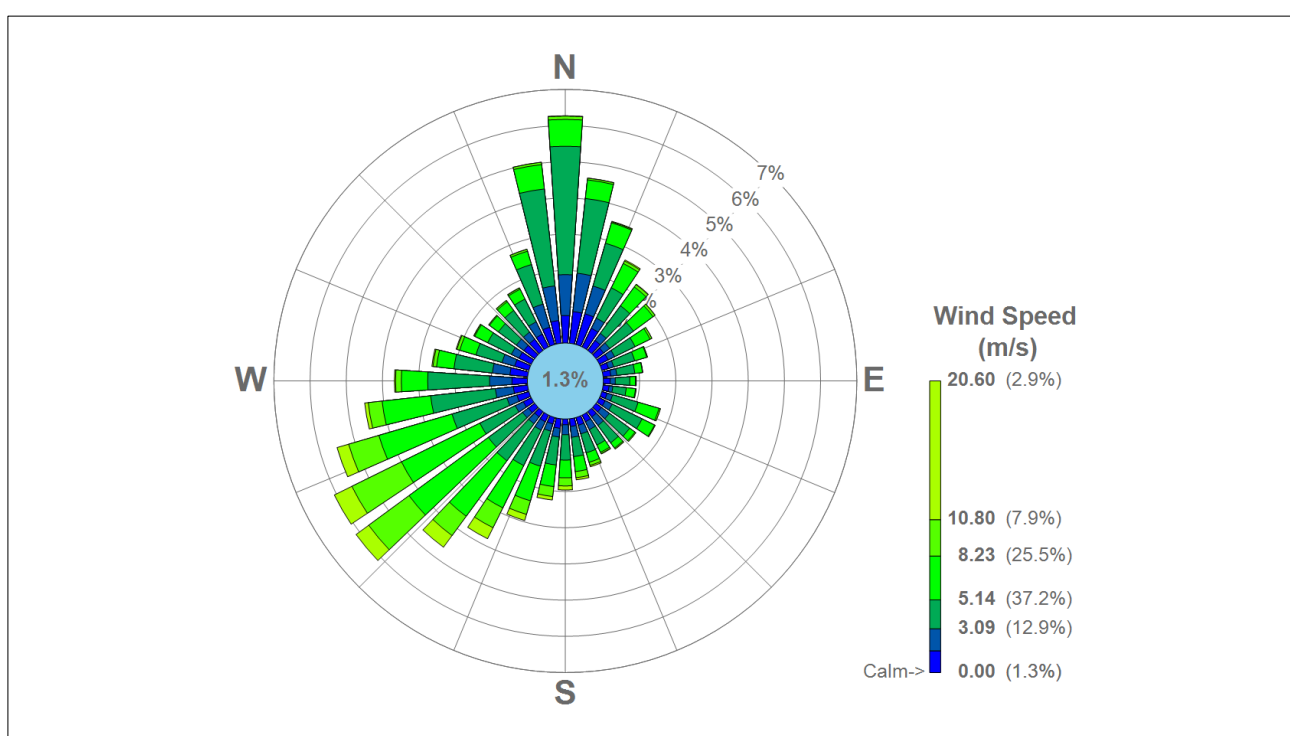


Figure 3: Shoreham Data: Windrose 2013-2017

Table 5 provides a summary of the five-year hourly wind direction data for Shoreham meteorological station. All meteorological data was provided by Atmospheric Dispersion Modelling (ADM) Ltd, which is an established distributor of meteorological data within the UK.

Table 5: Five-Year Average Shoreham Wind Direction Data (2013-2017)

Direction wind blowing from (in 22.5° segments)	5-Year Average of Hourly Wind Directions	
	Total Hours	% of Hours in Year
E	316	3.6
ENE	204	2.3
ESE	265	3.0

Direction wind blowing from (in 22.5° segments)	5-Year Average of Hourly Wind Directions	
	Total Hours	% of Hours in Year
N	805	9.2
NE	314	3.6
NNE	423	4.8
NNW	1,268	14.5
NW	309	3.5
S	638	7.3
SE	217	2.5
SSE	276	3.2
SSW	760	8.7
SW	1,072	12.2
W	720	8.2
WNW	291	3.3
WSW	867	9.9
Missing	21	0.2

5. Field Odour Survey Results.

As detailed in Section 4, the biogas digester at Wicks Farm has not yet been constructed and as such, it was not possible to undertake sniff tests for this facility. This Section therefore only details the results of the sniff tests for Besmoke Ltd.

Furthermore, results have only been reported where the average odour intensity (I_{mean}) at a sampling location is greater than zero (when rounded to the nearest whole number). Where the average odour intensity is calculated to be 0, the IAQM guidance states the odour effect will be negligible. The full results including the maximum odour intensity at each location are presented in Appendix 5.

5.1 Besmoke Ltd Southern Transect.

Odour was detected during a number of the 10 second intervals at location S1 during the five minute survey and is described as a “sweet cooking smell” and “burning wood”. This was likely to be attributable to Besmoke Ltd.

The maximum and average intensity score along with the odour pleasantness was recorded at location S1 is detailed in Table 6 below.

Table 6: Maximum Intensity Score, Average Intensity Score and Odour Pleasantness

Sniff Test Location	Maximum Intensity Score	Average Intensity Score (I_{mean})	Odour Pleasantness
S1	3	1	Pleasant

As detailed in Section 3.1.2, only odour intensity scores greater than 4 should be considered when determining the odour extent. The maximum odour intensity score recorded at location S1 was 3. As such, the odour extent has not been calculated and in line with IAQM guidance, the odour effect at the time and place of sampling, is negligible.

5.2 Summary of Field Odour Surveys.

During the Field Odour Surveys completed in October and November 2020, for Besmoke Ltd, the average intensity score for all surveys across all survey days, ranged between 0 and 1, meaning that overall, the odour effect, at the time and place of sampling is considered to be negligible at all sniff test locations.

6. Cumulative Odour Impact Assessment.

The operation of Besmoke Ltd, the Wicks Farm biogas digester and the Grundon Waste Transfer Station has the potential for cumulative odour impacts to occur at sensitive receptors at the Proposed Development. This Section considers the potential for odour to occur at the Proposed Development from each of the facilities individually and then assesses the potential for a cumulative impact.

6.1 Besmoke Ltd.

A combination of operational activities, existing complaints data and conclusions from the sniff tests have been used to determine the impacts at the Proposed Development from Besmoke Ltd.

The Proposed Development is located to the north, west and south of Besmoke Ltd with the nearest potential residential units approximately 50m to the north.

The Proposed Development has the potential to be downwind of Besmoke Ltd when the wind is blowing from the east south east direction clockwise through to the north. Winds from these directions occur for 85% of the year on average.

Field Odour Surveys were undertaken at the Application Site during conditions where the wind was blowing from the north, north-east and east. Using the IAQM guidance, the odour effect at the time and place of sampling, was negligible. It is therefore considered that other potential residential receptors, that may be located downwind of Besmoke Ltd would also experience negligible odour effects. Furthermore, the sniff tests were undertaken during conditions with low wind speeds which is when odour can accumulate as it is not diluted or dispersed as it would be when wind speeds are higher. As such, conditions during the Field Odour Surveys were representable of when odour effects are likely to occur.

Furthermore, Besmoke Ltd has been operating for a significant amount of time with limited complaints and none of the complaints to ADC directly mention odour and are unsubstantiated, as detailed in Section 4. It is therefore considered, based on the above, that odour impacts from this facility at the Proposed Development will be not significant.

6.2 Wicks Farm Biogas Digester.

As detailed in Section 4, the Wicks Farm biogas digester has not been constructed and is therefore not currently operational.

The odour assessment (ref: Air Quality Consultants, July 2016, ref: J2611/1/F1) submitted as part of the planning application (WSCC/026/16/F) concluded that the odour effects will be negligible at the majority of receptors including one adjacent to the biogas digester site which is located approximately 60m from the site. Overall, the effect was considered to be slight adverse with any adverse effects likely to be very occasional. To protect the amenity of residents, the planning consent (Decision Notice WSCC/026/16/F) included Condition 3 requiring an Odour Management Plan to be approved by the planning authority

A further planning application was made (ref. WSCC/019/17/F) to amend the location of the digestate lagoon. The odour note submitted with the application states in paragraph 3, *"the lagoon itself is entirely sealed, so there will be no direct release of odorous gas that might impact nearby receptors"* and concluded in paragraph 5 that *"the relocation of the digestate lagoon to a point adjacent to the western boundary of the main AD facility will not result in any significant odour effects"*.

The Proposed Development is located to the south of the consented biogas digester and lagoon with the nearest potential residential units approximately 70m from the digester site. Using the percentages detailed in Table 5, potential odour from the Wicks Farm biogas digester could occur at the Proposed Development for 28.5% of the year however for the majority of the year (71.5%), the Proposed Development is located upwind of the Wicks Farm biogas digester and lagoon.

There are existing residential properties closer to Wicks Farm than the Proposed Development, and these were taken into account in the assessment for the digester. The digester and the lagoon were not considered to be a significant source of odour (Air Quality Consultants, April 2017, Ref. J2611/B/F).

When considering the potential low magnitude of the emission source, the distance from the proposed potential residential units and the frequency of wind in the direction of the Proposed Development, the potential for loss of amenity due to odour is considered to be negligible.

6.3 Grundon Waste Transfer Station.

A combination of operational activities and existing complaints data have been used to determine the potential impacts at the Proposed Development from the Grundon Waste Transfer Station.

The Proposed Development is located to the immediate west of the Grundon Waste Transfer Station, with the nearest proposed residential properties located 100m from the Grundon Waste Transfer Station site boundary. Parts of the Proposed Development are located downwind of the Grundon Waste Transfer Station when the wind is blowing from sectors ranging from north-east, clockwise, through east to south-east which occurs for 15% of the hours of an average year.

As identified in Figure 3, the prevailing wind direction is from the south-west, with a strong northerly component. There are no residential properties proposed to the north-east or south of the Grundon Waste Transfer Station and therefore for the majority of the year (52.6%), the Application Site is located upwind of the facility. There are existing residential properties located approximately 220m to the north-east however as detailed in Section 4.1.3, no specific odour complaints regarding the facility have been reported to ADC.

As detailed in Section 4.1.3, the Environmental Permit for the facility, states that *"emissions from the activities shall be free from odour at levels likely to cause pollution outside the site [...]".* The Environmental Agency is responsible for enforcing the Environmental Permit, and the NPPF requires planning decisions to assume that this regime is effective at controlling the odour.

For the majority of the time, the Application Site is located upwind of the Grundon Waste Transfer Facility, and there have been no specific odour complaints regarding the facility from existing residential properties to the north-east, which are located downwind of the facility for the majority of the year.

6.4 Cumulative Odour Impacts.

Besmoke Ltd, Wick Farm biogas digester and the Grundon Waste Transfer Station are all located in different directions from the Application Site. The Application Site is downwind of the three facilities when the wind is blowing from different directions. As such, no single proposed residential property will experience odour from all three facilities at any one time. Furthermore, due to the size of the Proposed Development and the distances between each of the potential odour sources, any odours occurring from the facilities would likely be localised and would not be experienced across the entire Application Site.

Following a review of the available information, there is no evidence that there is likely to be a significant odour impact on the proposed residential receptors due to the operations of Besmoke Ltd or the Wicks Farm biogas facility. There should be no odour beyond the boundary of the Grundon Waste Transfer Station according to its Environmental Permit. The environmental permitting regime provides remedies for non-compliance with permit conditions, and in accordance with NPPF, this is an environmental permitting issue not a planning issue and it will need to be resolved by the Environment Agency.

For the reasons given above no cumulative odour impact is anticipated.

6.5 Conclusion.

In conclusion, the potential odour impacts from Besmoke Ltd and Wicks Farm biogas digester and lagoon are considered negligible. For the Grundon Waste Transfer Station, when operating in compliance with the planning consent and Environmental Permit, the odour impacts are considered to be negligible. As such, there are no cumulative odour impacts from Besmoke Ltd, Wicks Farm biogas digester and the Grundon Waste Transfer Station on the Proposed Development.

7. Conclusions.

Hoare Lea has been commissioned by Redrow Homes and Wates Developments Ltd to undertake an Odour Impact Assessment in support of a planning application for a Proposed Development at Ford Airfield, Ford, West Sussex.

The Cumulative Odour Impact Assessment has been undertaken at the request of Arun District Council, to assess the potential for odour impacts on the Proposed Development from Besmoke Ltd, a foodstuff smoking facility, Wicks Farm biogas digester and Grundon Waste Transfer Station .

A series of Field Odour Surveys or 'Sniff Tests' have been undertaken on four separate days to determine whether under various meteorological conditions, there is potential for odour impacts at the Proposed Development due to Besmoke Ltd. During the first site visit, it was confirmed that the biogas digester at Wicks Farm had not yet been constructed.

As a result of the sniff tests for Besmoke Ltd, it was determined that the odour effect is considered to be negligible. This combined with the small number of odour complaints, unsubstantiated by ADC, it is considered that impacts associated with Besmoke Ltd at the Proposed Development will be not significant.

There should be no odour beyond the boundary of the Grundon Waste Management Station. The planning system requires decisions to be taken assuming that the Environmental Permitting Regime is effective at controlling pollution, including odour. As such, odour effects from the Grundon Waste Transfer Station are considered to be negligible.

With regards to the Wicks Farm biogas digester, a review of the documents submitted as part of the planning application and considering the potential low magnitude of the emission source, the distance from the proposed potential residential units at the Proposed Development and the frequency of wind in the direction of the Proposed Development, the potential for odour impacts is considered to be negligible.

In conclusion, there are no potential cumulative odour impacts from Besmoke Ltd, the Wicks Farm biogas digester and lagoon and the Grundon Waste Transfer Station at the Proposed Development.

8. References.

¹ Institute of Air Quality Management (2018) Guidance on the assessment of odour for planning (version 1.1)- [Online], Available: <http://www.iaqm.co.uk/text/guidance/odour-guidance-2014.pdf>

² Defra (2011) Odour Guidance for Local Authorities {withdrawn: 15th September 2017}

³ Ministry of Housing, Communities & Local Government (2019) National Planning Policy Framework – [Online], Available: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/810197/NPPF_Feb_2019_revised.pdf

⁴ Arun District Council (2018) Adopted Arun Local Plan 2011-2031 – [Online] Available at: <https://www.arun.gov.uk/download.cfm?doc=docm93jjjm4n12844.pdf&ver=12984>

⁵ <https://www.yr.no/?spr=eng>

⁶ VDI-Verlag GmbH (1993) VDI 3940 Determination of Odourants in Ambient Air by Field Inspections

Appendix 1 – Consultation with Arun District Council Environmental Health Department.

From: Fiona Fitzgerald <Fiona.Fitzgerald@arun.gov.uk>
Sent: 09 November 2020 10:42
To: Chris Rush <ChrisRush@hoarelea.com>
Subject: RE: Ford site - odour proposed assessment

[External email]

Dear Chris,

Apologies for the late reply.

Environmental Health are in agreement with the approach you detailed in your email below.

I have provided the complaint data for Besmoke Ltd, do you still require complaint data for the Wick Biogas Digester?

In terms of permits, I will check with my colleague who is in tomorrow and get back to you on this.

Planning documents will be available on the planning portal, apologies but I am unable to remember the planning application numbers for these sites.

Regards

Fiona

Fiona Fitzgerald
Senior Environmental Health Officer
Environmental Health

T: 01903 737674
E: fiona.fitzgerald@arun.gov.uk

Arun District Council, Civic Centre, Maltravers Rd, Littlehampton, West Sussex, BN17 5LF
www.arun.gov.uk

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AIR QUALITY
CUMULATIVE ODOUR IMPACT
ASSESSMENT FOR BESMOKE LTD,
WICKS FARM BIOGAS DIGESTOR AND
GRUNDON WASTE TRANSFER

From: Chris Rush
Sent: 09 October 2020 19:49
To: Fiona Fitzgerald
Cc: Planning.Responses; Kathryn Woolley; Charlotte Smith
Subject: Ford site - odour proposed assessment

Categories: To save off

Hi Fiona,

Thanks for the below.

I can confirm that as discussed we can progress with the assessment work for Wick Biogas Digester and Besmoke Ltd.

This would consist as discussed of:

- a qualitative (no modelling or sampling) assessment
- review of the odour complaint history – are you able to provide this please – ideally for the past 5 years as a minimum to help us to determine the frequency and types of complaints
- review operational information available for both facilities – again have you got any detail relating to this that may assist – this will include review of any permits and or the approved planning applications.
- undertake a desktop review using the most recent Masterplan for the Ford Airfield proposed development site to identify the proximity of potential sensitive receptors, in particular 'high sensitivity' receptors such as proposed residential properties in relation to both Besmoke Ltd and Wicks Farm.
- we would also propose to carry out a site visit to view the outside of these facilities from the Ford residential proposed development site. At this time we propose to undertake a series of sniff tests. These will consist of onsite walkovers at Ford Airfield and in the vicinity of both Besmoke Ltd and Wicks Farm. This will be undertaken by a single individual.
- the sniff tests and subsequent reporting will be undertaken in line with the Institute of Air Quality Management (IAQM) 'Guidance on the assessment of odour for planning, Appendix 2 – Sniff Testing'. It is proposed that the sniff tests are undertaken by a single assessor on three separate days to allow for possible fluctuations in odour from the sources. If possible, this will be done over 3 consecutive days however due to the time of year (i.e. Autumn/Winter), this will be dependent on weather conditions being dry with low wind speeds. It should also be noted as we discussed that it is sub optimal to carry out sniff tests at this time of the year – typically carrying these are conducted April to September time. As such we would also propose as an option to follow up with further sniff tests should these be required to help validate findings as part of a condition.
- We would propose to provide this qualitative (without modelling) cumulative odour assessment following the IAQM 'Guidance on the assessment of odour for planning' as a stand-alone technical assessment.

Are you able to please confirm agreement with the above approach.

With regards Grundon as discussed I will need to consult with the planning consultants (Barton Willmore) on this further and can come back to you on this item.

Any queries please do let me know as happy to discuss.

Best Regards,

Chris Rush
Senior Associate

DDI +44 161 672 7132
Tel +44 161 834 4754
Mob +44 7548 345 081
Email chris.rush@hoarelea.com

LAND AT FORD AIRFIELD

REDROW HOMES SOUTHERN AND
WATES DEVELOPMENTS LTD

AIR QUALITY

CUMULATIVE ODOUR IMPACT
ASSESSMENT FOR BESMOKE LTD,
WICKS FARM BIOGAS DIGESTOR AND
GRUNDON WASTE TRANSFER

From: Fiona Fitzgerald <Fiona.Fitzgerald@arun.gov.uk>
Sent: 08 October 2020 13:39
To: Chris Rush <ChrisRush@hoarelea.com>
Cc: Planning.Responses <Planning.Responses@arun.gov.uk>
Subject: Ford site

[External email]

Dear Chris,

Apologies again for not contacting you back. I have a broadband failure (also affecting the phone) and we are awaiting the engineers visit tomorrow. My training over-ran and I now need to let my husband have the ipad as a hot spot as he has been unable to work all morning!

With regard to our conversation yesterday:

I think we came to the agreed conclusion that you would carry out an odour assessment (possibly not until April 2021) to include both the Wick Biogas Digester and Besmoke Ltd, and also to look at cumulative odour impacts. Do you agree with this?

I note your feedback regarding the Grundon site.

However, I would state that the permit condition states "emissions from the activities shall be free from odour at levels likely to cause pollution outside the site". I am mindful that there may be instances when odour is detectable but not at a level where it will be considered a breach of the permit. It is this level of impact that I have concerns about, as well as the cumulative impact with potential odour sources as discussed yesterday.

Therefore, I consider that it is important that the Grundon site be considered within your cumulative odour impact assessment.

I am happy to discuss this further (broadband issues notwithstanding!), but am on leave tomorrow, so it would need to be Monday or afterwards.

Many thanks

Fiona

Fiona Fitzgerald
Senior Environmental Health Officer
Environmental Health

T: 01903 737674
E: fiona.fitzgerald@arun.gov.uk



Arun District Council, Civic Centre, Maltravers Rd, Littlehampton, West Sussex, BN17 5LF

Appendix 2 – Beaufort Scale.

Table All-1 details the Beaufort scale which was utilised during the Field Odour Surveys to assist in determining wind conditions on site.

Table All-1: Beaufort Scale

Wind Force Number	Description	Speed in mph	Speed in kph	Observation
0	Calm	0-1	0-1	Smoke rises vertically
1	Light Air	1-3	1-5	Smoke drifts slowly
2	Slight Breeze	4-7	6-11	Wind felt on face; leaves rustle; flags stir
3	Gentle Breeze	8-12	13-19	Leaves and twigs in constant motion; wind extends light flags
4	Moderate Breeze	13-18	21-29	Dust and small branches move; flags flap
5	Fresh Breeze	19-24	31-39	Small trees with leaves begin to sway; flags ripple
6	Strong Breeze	25-31	41-49	Large branches move; flags beat
7	Moderate Gale	32-38	52-61	Whole trees move; flags extended
8	Fresh Gale	39-46	63-74	Twigs break off trees; walking is hindered
9	Strong Gale	47-54	76-88	Slight damage to houses (such as slates removed)
10	Whole Gale	55-63	89-102	Trees uprooted; much damage to houses
11	Storm	64-72	104-117	Widespread damage
12	Hurricane	73-82	118-134	Excessive damage

Appendix 3 – Field Odour Survey Report Forms.

Site:	Besmoke Ltd – Wednesday 14 th October			
Description of Overall Weather Conditions:	Light breeze, dry, mild			
Start Time:	17:20			
End Time:	18:05			
Temperature (°C):	12.3 °C			
Wind Speed (m/s):	1.6			
Wind Direction:	NE			
Beaufort Scale:	1			
Cloud Cover (Oktas):	7			
Description of odour:	Very faint sweet cooking smell during survey 2 Did not smell like wood burning/smoking			
Other Comments:	Survey 2 was close to existing housing at 17:35			

Site:	Besmoke Ltd – Thursday 15 th October			
Description of Overall Weather Conditions:	Dry, light breeze, cold			
Start Time:	09:30	09:40	10:20	
End Time:	09:37	09:48	10:28	
Temperature (°C):	11.5	10.1	11.2	

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Wind Speed (m/s):	2.1	1.1	1.0	
Wind Direction:	N	N/NE	N	
Beaufort Scale:	1	1	1	
Cloud Cover (Oktas):	6	6	4	
Description of odour:		Sweet cooking smell		
Other Comments:	Fuel smell			

Site:	Besmoke Ltd -Thursday 15 th October			
Description of Overall Weather Conditions:	Dry, light breeze, cold			
Start Time:	9:55	10:04	10:12	
End Time:	10:02	10:10	10:19	
Temperature (°C):	11.4	11.0	11.2	
Wind Speed (m/s):	0.4	1.3	3	
Wind Direction:	NE/E	E	N/NE	
Beaufort Scale:	1	2	1	
Cloud Cover (Oktas):	5	4	4	
Description of odour:		Very faint sweet cooking/burning wood odour when wind was stronger	Sweet cooking/burning wood	
Other Comments:				

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GRUNDON WASTE TRANSFER**33**

Site:	Besmoke Ltd –Thursday 15 th October			
Description of Overall Weather Conditions:	Dry, moderate breeze, cold			
Start Time:	12:04	12:18	15:57	
End Time:	12:10	12:27	16:06	
Temperature (°C):	13	13.2	14.1	
Wind Speed (m/s):	3.6	2.4	1.3	
Wind Direction:	N	N/NE	N/NE	
Beaufort Scale:	3-4	3-4	1	
Cloud Cover (Oktas):	2	2	4	
Description of odour:	Sweet cooking smell and burning wood	Sweet cooking smell and burning wood		
Other Comments:				

Site:	Besmoke Ltd – Friday 6 th November			
Description of Overall Weather Conditions:	Cool, light to moderate breeze, dry			
Start Time:	15:40	15:45	16:00	
End Time:	15:45	16:00	16:05	
Temperature (°C):	13.1	12.9	12.9	
Wind Speed (m/s):	2.1	3.0	3.1	
Wind Direction:	E	E	E	

LAND AT FORD AIRFIELDREDROW HOMES SOUTHERN AND
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34

Beaufort Scale:	2	3	3	
Cloud Cover (Oktas):	2	2	2	
Description of odour:				
Other Comments:				

Site:	Besmoke Ltd – Saturday 7 th November			
Description of Overall Weather Conditions:	Mild, low breeze, dry			
Start Time:	09:39			
End Time:	09:45			
Temperature (°C):	11.5			
Wind Speed (m/s):	1.9			
Wind Direction:	E			
Beaufort Scale:	1			
Cloud Cover (Oktas):	2			
Description of odour:				

Appendix 4 – IAQM Sniff Test Sampling Procedure.

Box 4 below has been taken from the IAQM guidance¹ and provides details of how to undertake the sniff tests.

Box 4: Example of sniff test sampling procedure

The sensory test is carried out at each test location over a standard observation time, typically 5 minutes. Testing should start from locations affected by the least-intense odours, to avoid olfactory fatigue. For each test location, the start time of the observation period and the attributes of the odour over the observation period are recorded as follows:

i) The assessor breathes normally, inhaling ambient air samples through the nose at regular intervals (say, every 10 seconds, to give 30 samples over typically a 5 minute observation period). However, where the odour levels are either constant or intense then the odour assessor should avoid olfactory fatigue/desensitisation by alternating each sample sniff of ambient air with a sniff of odour-free air from an ori-nasal face mask fitted with carbon filters.

ii) For each sample, the odour intensity (VDI scale, 0-6) is recorded.

iii) At the end of the observation period at the test location, the odour unpleasantness is noted down by classifying it as unpleasant, neutral (neither pleasant nor unpleasant) or pleasant. This assumes that at least some of the 30 samples were of intensity 3 or more ("i.e. the odour is at least "barely recognisable").

iv) The odour descriptor should also noted: odours can be objectively described using standardised categories and reference vocabulary. It is useful to provide odour assessors with standard descriptor terms, which are organised with similar terms in categories and groups either as a list or as an "odour wheel".

v) Next the pervasiveness/extent of the odour at this test location is assessed. This can be calculated as the percentage odour time, t_{124} , which is the number of samples where odour was recognisable divided by the total number of samples (i.e. 30). Note that "recognisable odour" is where the odour strength exceeds the recognition threshold and is definitely recognisable by the assessor, i.e. the assessor is capable of definitely identifying its quality/character, which corresponds to VDI intensity of 4 or more.

vi) The average odour intensity, I_{mean} , over the test period is calculated and the maximum intensity observed is noted.

The above procedure is then repeated at the next test location, remembering that the character of an odour mixture can change over distance, as the particular components may become diluted below their individual detection thresholds at different distances.

A record should be kept of the meteorological conditions at the time of testing (including wind strength and direction, atmospheric stability category, barometric pressure, rainfall, temperature and humidity), together with information relating to the operations and activities being undertaken on site and in the surrounding area.

Appendix 5 – Verein Deutscher Ingenieure (VDI) Odour Intensity Tables.

Site	VDI SCALE															
	Besmoke Ltd															
Date	14th October 2020			15th October 2020						15th October 2020			6th November 2020			7th November 2020
Sample	C1	C2	C3	C1	C2	C3	W1	W2	W3	S1	S2	S2	W1	W2	W3	C3
1	0	0	0	0	0	0	3	0	0	0	0	1	0	0	0	0
2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	2	0	0	0	3	0	0	0	0	0	0	0
4	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0
5	0	0	0	0	2	0	0	1	0	0	0	1	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0
9	0	0	0	0	0	0	0	2	0	0	0	0	0	0	3	0
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0
11	0	0	0	0	0	0	0	2	0	0	0	0	0	0	3	0
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0
13	0	1	0	0	0	0	0	0	0	0	0	0	0	0	3	0
14	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0
17	0	0	0	0	0	0	2	2	0	3	1	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	3	1	0	0	0	0	0
19	0	0	0	0	0	0	2	0	1	3	0	0	0	0	0	0
20	0	0	0	0	0	0	2	0	1	3	1	0	0	0	0	0
21	0	0	0	0	2	0	0	0	0	0	1	0	0	0	0	0
22	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0
Maximum VDI	1	1	0	0	2	0	3	2	3	3	1	1	0	0	3	0
Average VDI	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
% Number VDI ≥4	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Exposure	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible

Appendix 6 – Professional Experience.

Chris Rush (Hoare Lea), BSc (Hons), MSc, PG Dip Acoustics, CEnv, MIOA, MIEMA, MIEEnvSc, AMIAQM

Chris is a Senior Associate Air Quality Consultant with Hoare Lea. He is a Chartered Environmentalist, a Member of the Institute of Acoustics, a Full Member of the Institute of Environmental Management and Assessment, a Member of the Institution of Environmental Sciences and an Associate Member of the Institute of Air Quality Management.

He has a diverse portfolio of experience and has worked on a range of projects from initial site feasibility, through planning and development to construction and operation. Chris's expertise covers planning, noise and air quality, specifically in relation to residential developments, industrial fixed installations such as waste management centres and transportation environmental impact on developments including air traffic. Chris is involved in the testing and assessment of the impact of indoor air quality and how building design contributes to this.

Dr Claire Holman (Brook Cottage Consultants Ltd), BSc (Hons), PhD, CSci, CEnv, FIEEnvSc, FIAQM

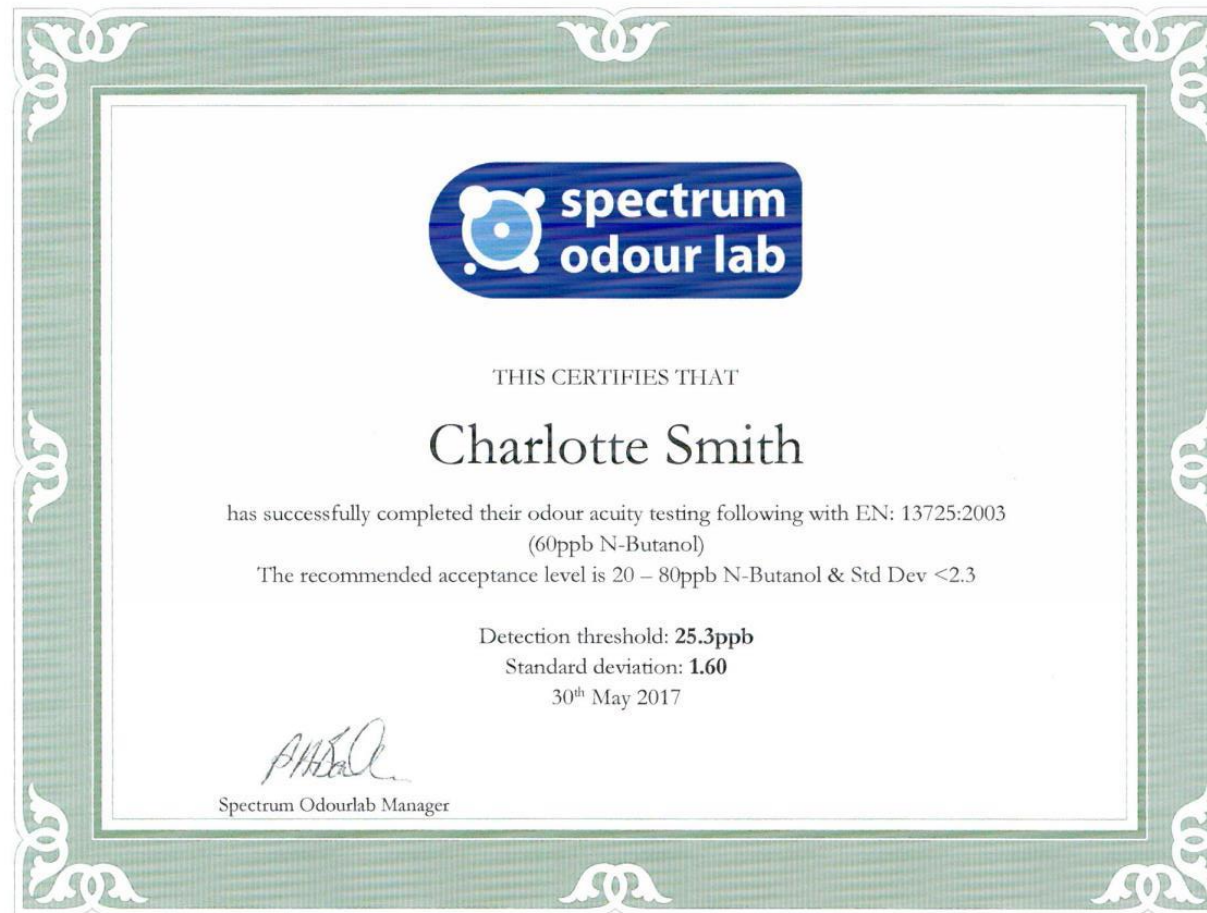
Claire is a Director of Brook Cottage Consultants Ltd., which provides air quality expertise to a range of industrial and public sector clients. She provides an advisory role with review and input at key stages of projects for Hoare Lea.

Claire has worked on air quality management for over 35 years. She has experience of developing emission inventories, emission control, ambient monitoring, dispersion modelling, cost benefit and cost-effectiveness analysis and policy development. She has undertaken numerous air quality assessments for new developments. She also advised governments in Europe, Asia and Africa, as well as the European Commission and the Japan Clean Air Program on strategic air quality and climate change issues for the development of policy and new regulations. She is a Chartered Scientist and a Chartered Environmentalist as well as a Fellow of the Institute of Air Quality Management and the Institution of Environmental Sciences.

Charlotte Smith (Hoare Lea), BSc (Hons), AMIEEnvSc, AMIAQM

Charlotte is a Senior Air Quality Consultant at Hoare Lea with over five years' experience in air quality consultancy. She has worked on a range of projects across a number of industries including residential, educational, commercial and industrial for site feasibility studies, planning applications and Environmental Impact Assessments. She also has experience in qualitative odour studies and has been successfully tested for odour acuity. She also has experience in air quality monitoring at sites ranging from residential and educational facilities to large road network schemes. Charlotte's interests lie in the effects that pollution has on human health and wellbeing.

Appendix 7 – Odour Acuity Certification.





CHRIS RUSH

SENIOR ASSOCIATE

+44 161 672 7132
chrisrush@hoarelealea.com

HOARELEA.COM

Royal Exchange
Manchester
M2 7FL
England

