

BAE Systems Plc

BAE Waterlooville

Odour Assessment

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1 Introduction

- 1.1.1 This report describes the potential for odour nuisance from the drive-through restaurant proposed as part of the mixed-use development of land adjacent to Hambledon Road and Elettra Avenue, Waterlooville.
- 1.1.2 The site is currently occupied by the BAE Systems Technology Park and there are no existing odour issues associated with the site. The proposals include the provision of a drive-through restaurant of 240m² floor space, as well as industrial units, a car showroom, a 60 bed hotel and a restaurant.
- 1.1.3 Cooking activities have the potential to lead to the release of odours, which have the potential to cause nuisance to local residents and proposed businesses.
- 1.1.4 This report examines the potential for odour nuisance as part of the redevelopment proposals, and recommends methods to mitigate the impact.

2 Planning Policy

2.1 Odour Guidance and Legislation

2.1.1 There are currently no statutory standards or objectives in the UK covering the release and subsequent impacts of odours. This is due to complexities involved with measuring and assessing odours against compliance criteria, and the inherent subjective nature of odours.

2.1.2 It is recognised that odours have the potential to pose a nuisance for residents living near to an offensive source of odour. Determination of whether or not an odour constitutes a statutory nuisance in these cases is usually the responsibility of the local planning authority or the Environment Agency. The Environmental Protection Act 1990 (Stationery Office, 1990) outlines that a local authority can require measures to be taken where:

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

"fumes or gases are emitted from premises so as to be prejudicial to health or cause a nuisance.."

2.1.3 Defra have released Guidance on the Control of Odour and Noise from Commercial Kitchen Exhaust Systems (Defra, 2005). This guidance provides information on best practice techniques for the minimisation of odour (and noise) nuisance from kitchen exhaust systems.

2.2 National Planning Policy

2.2.1 The National Planning Policy Framework was published in March 2012. This sets out the Government's planning policies for England and how they are expected to be applied. In relation to conserving and enhancing the natural environment, paragraph 109 states that:

"The planning system should contribute to and enhance the natural and local environment by.... preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability."

2.2.2 Pollution is defined by the NPPF 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 smoke, fumes, gases, dust, steam, odour, noise and light."

2.3 Local Planning Policy

2.3.1 The Havant Core Strategy was adopted in March 2011. Policy DM5, Control of Class A3, A4 and A5 Food, Drink and Entertainment Uses, states:

"Planning Permission will only be granted for the construction of new entertainment and hot food uses falling within Use Classes A3, A4, A5 and D2 of the Use Classes Order 1987 (as amended)..... where it can be demonstrated that all the following criteria are met:

- 1. Measures are incorporated, where a proposal includes the preparation of hot food, to mitigate the effect on nearby properties.*
- 2. The measures proposed in respect of criterion 1 are such that the installation does not materially detract from the appearance of the building itself and the wider locality.*
- 3. The measures proposed in respect of criterion 1 are suitable for the range and nature of hot food to be prepared on the premises...."*

3 Methodology

- 3.1.1** Consideration is given to the type of drive-through proposed, prevalent wind conditions in the area, odour complaints received by Havant Council, and the location of existing and proposed receptors in order to determine the risk of odour impacts arising, and the requirement for mitigation. The risk of odour impacts is calculated based on the Guidance on the Control of Odour and Noise from Commercial Kitchen Exhaust Systems (Defra, 2005).

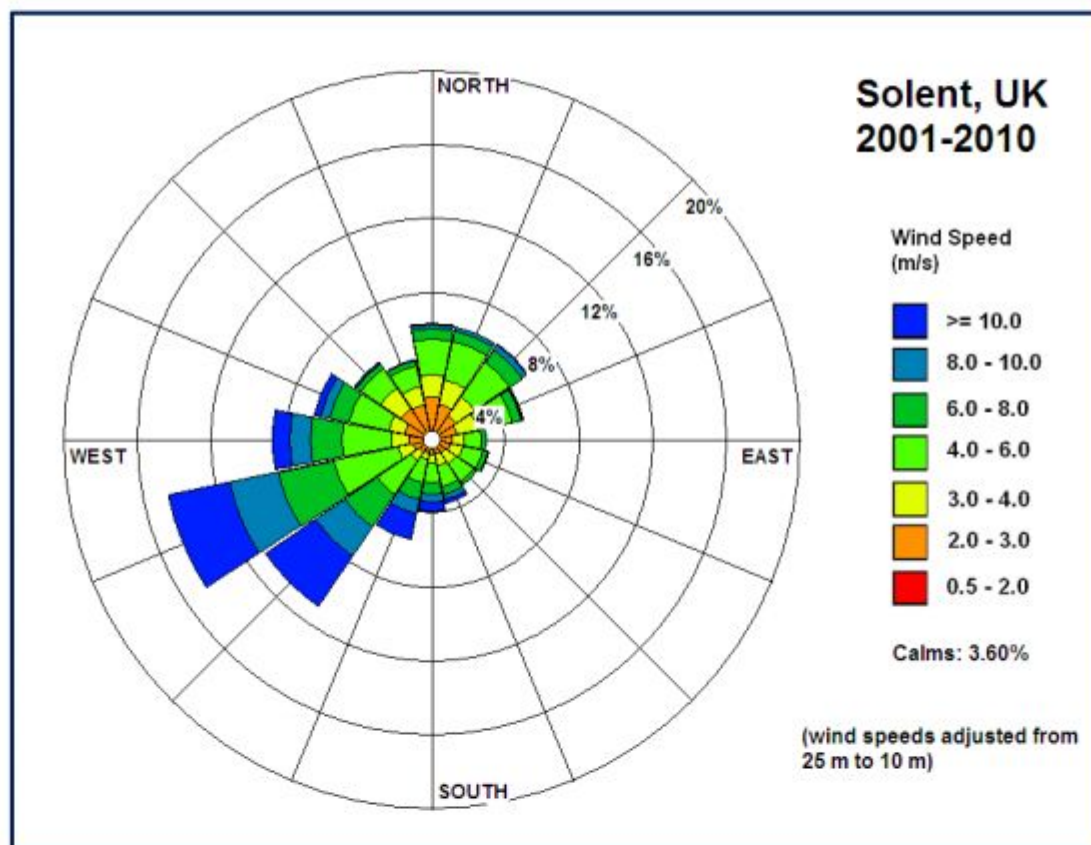
4 Odour Assessment

4.1 Wind Conditions

4.1.1 Odours have the potential to impact upon sensitive receptors only when the wind is blowing across a source of odour towards them, at a time when an odour is being emitted.

4.1.2 A wind rose summarising the wind speed and direction data for the 2001 – 2010 period at the Solent meteorological station is presented in **Figure 1**. This site is considered representative of conditions within Waterlooville. The wind rose shows that the prevalent wind direction is southwesterly, with winds from this sector occurring approximately 30% of the time. Winds from the north and southeast occur less frequently (16% and 9.5% of the time, respectively).

Figure 1: Solent Wind Rose 2001 – 2010



4.2 Site Location and Existing Receptors

4.2.1 The site of the proposed drive-through is located adjacent to Hambledon Road (B2150) and Elettra Avenue, immediately south of the roundabout. Currently the site is occupied by the BAE Systems Technology Park. The closest existing properties are located at least 80m northeast of the proposed drive-through. Based on wind direction, there is the potential for these properties to experience odours for 30% of the time based on the prevalent wind direction, should odours be emitted from the proposed drive-through.

4.3 Complaints Record

- 4.3.1** Havant Council has provided information relating to odour complaints from food establishments in their district. The number, frequency and location of past odour complaints are useful in predicting the potential for impact of a source at the proposed development site.
- 4.3.2** Since 2003, there have been 36 odour complaints from residents of properties in proximity to take away food establishments, equating to four complaints per year on average. All complaints have related to KFC restaurants, whilst the majority have related to the drive-through KFC at 149 London Road, Cowplain. The closest residential property to the Cowplain KFC is located within 5m.
- 4.3.3** A consultation with Havant Council confirmed that there have been no complaints relating to odour from residential properties in Hambledon Road / Farrell Close, which are the closest to the proposed drive-through.

4.4 Risk of Odour Impacts

- 4.4.1** The proposed drive-through has the potential to result in odour releases from the building. Whether or not these odours cause a nuisance will depend on the strength and nature of the odours, and the sensitivity of the receiving environment.
- 4.4.2** Defra Guidance on the Control of Odour and Noise from Commercial Kitchen Exhaust Systems (Defra, 2005) states that the potential for odours from commercial kitchens is influenced by three primary factors:
- The size of the cooking facility;
 - The type of food prepared; and
 - The type of cooking appliances used.
- 4.4.3** The primary concern with respect to odours will be the preparation of food in the kitchen area. Significant odours are not likely to be produced by any other areas of the proposed restaurant. An assessment of the risk of odour impacts is made following the methodology set out in Annex C of the Defra guidance (2005).

Size of Cooking Facility

- 4.4.4** The proposed drive-through has a floor area of 240m². This is considered to require a medium sized kitchen, and thus to be of medium risk based on the odour risk assessment criteria outlined in Annex C of the Defra Guidance on the Control of Odour and Noise from Commercial Kitchen Exhaust Systems (Defra, 2005).

Type of Food Prepared

- 4.4.5** The type of drive-through proposed is currently unknown. A range of drive-through restaurants exist, including KFC, Burger King, McDonalds and Costa. The principal odorous activities are anticipated to be the cooking within the proposed kitchen. Odours relating to a Costa drive-through would be less likely due to the minimal food preparation, but would be greater for a KFC or McDonalds due to the use of fryers.
- 4.4.6** The Defra guidance on control of odour from commercial kitchens rates fried chicken as having very high odour concentration and very high grease content from cooking activities, due to the use of meats and oils (Defra, 2005). Assuming that the drive-through is a KFC therefore provides a worst-case assessment.

Type of Cooking Appliance Used

- 4.4.7** On the assumption that the drive-through will be a KFC, the kitchen will predominantly use deep fryers and grills in the preparation of food. These methods typically have medium grease and smoke loading according to Defra's guidance on commercial kitchens (Defra, 2005). Cooking methods with higher grease and smoke loading characteristics require a greater degree of extraction and filtration to minimise odours.

Proximity of Receptors

- 4.4.8** Based on the Defra guidance on control of odour from commercial kitchens, the existing and proposed receptors are considered as medium risk due to proximity (20 – 100m).

Dispersion

- 4.4.9** Dispersion of any odour emissions from the stack would be restricted where low level discharge is proposed. It is assumed that the stack will discharge at roof height, and that the drive-through will therefore have moderate to good dispersion characteristics (in accordance with the Defra guidance).

Overall Risk

- 4.4.10** The proposed drive-through is likely to include hot food cooking methods which have the potential to release odours. The drive-through is located 80m from the closest existing residential properties, which lie downwind approximately 30% of the time. The development proposals will also include a hotel approximately 30m to the south (downwind 16% of the time) and a car showroom to the northwest (downwind 9.5%) of the time.
- 4.4.11** According to the Defra guidance on odours from commercial kitchens, the types of food likely to be prepared at the proposed restaurant have the potential to release very high concentrations of odour. Based on this, the proximity of the receptors and the likely dispersion characteristics, the overall risk level, in accordance with the Defra guidance, has been determined as High, requiring a high level of odour control.

- 4.4.12** The proposed drive-through therefore has the potential to cause odour nuisance at local residential properties in Hambledon Road, and at the proposed hotel and car showroom, if kitchen activities are left unmitigated.

5 Mitigation Measures

- 5.1.1** In order to minimise the potential for odours from the proposed drive-through, a ventilation and extraction system will be required to ensure that grease, smoke and odours are removed from the kitchen area quickly and efficiently. The Guidance on the Control of Odour and Noise from Commercial Kitchen Exhaust Systems (Defra, 2005) document sets out a range of potential mitigation measures, along with the advantages and disadvantages of each; the precise system required will depend on the type of end user.
- 5.1.2** The guidance identifies a range of available filters, suitable to mitigate low intensity odour problems, and also suitable for use as a pre-treatment step before further treatment. The further treatment options include:
- Electrostatic precipitation – limited to removing grease and not suitable as a primary source of odour control;
 - Adsorption – e.g. activated carbon, zeolites, silica and polymeric resins. Requires replacement once adsorption bed fully utilised. Activated carbon is very effective (80-99% removal);
 - Wet Scrubbing – dissolves odours within an adsorption medium (acid or alkali);
 - In-line Oxidation – using ozone and/or activated oxygen ions;
 - Odour Neutralising / Counteracting Agents – correct dosage critical; and
 - Stack – ensuring adequate stack height and discharge velocity, outside of the wake of surrounding buildings, with unimpeded flow (no cowls).
- 5.1.3** The introduction of a system based on the guidance set out is considered appropriate to mitigate the potential for odour impacts.

6 Summary and Conclusions

- 6.1.1** The proposed drive-through has the potential to cause odour nuisance from the cooking of food in the kitchen. As the end user is currently unknown, a worst-case assessment has been made in order to identify the potential for odour impacts. Based on the Guidance on the Control of Odour and Noise from Commercial Kitchen Exhaust Systems (Defra, 2005) and the proximity of the closest sensitive receptors, the risk of unmitigated odour impacts is considered to be high. As such, a high level of odour control could be required to reduce odours.
- 6.1.2** Odour complaints in Waterlooville relating to an existing KFC drive-through occur, on average, four times a year at properties located within a few metres of the restaurant. The proposed drive-through is located over 80m from existing properties, and will be located over 30m from proposed properties, and therefore fewer complaints are anticipated from the proposed facility than for existing facilities in the town.
- 6.1.3** The proposed kitchen should include an extraction and ventilation system to draw grease and odours from the kitchen into a controllable abatement system. There are a range of appropriate mitigation measures that could be implemented to minimise odour emissions. Ultimately, the system that will need to be installed will depend on the end user. The system is likely to include filters to remove odorous solids, before passing through further treatment to remove gaseous odours. The design and installation of an abatement system appropriate to the end user could be addressed through a planning condition to be satisfied once the end user is known.

7 References

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