

DEFRA Risk Assessment
Site: New Century Hall, Manchester

Date: 13th July 2022

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1 Introduction

1.1 This report sets out an odour risk assessment for a proposed bar / restaurant

1.2 The proposed unit will require a number of kitchen extraction systems serving cooking pods which must be suitably designed to avoid any odour impacts relating to cooking odours being released to the atmosphere from the system.

1.3 This report sets out the methodology and findings of the odour risk assessment, and describes the odour abatement that will be required for the kitchen extraction system to minimise the risk of odour impacts resulting from the operation of the proposed unit. This report has been prepared by Solution Environmental Services Ltd.

2 Odour Assessment

2.1 Defra's Guidance on the 'Control of Odour and Noise from Commercial Kitchen Exhaust Systems' (Defra, 2005) contains an assessment procedure for identifying the potential risk of odour impacts from commercial kitchen operations. The results of this risk assessment can be used to determine a suitable level of odour abatement to be installed into a commercial kitchen.

2.2 The risk assessment for odours is split into the following four parts:

- dispersion;
- proximity to receptors;
- size of kitchen; and
- cooking type and grease loading.

2.3 Each part is given a risk rating score and the total risk rating denotes the level of odour abatement which is likely to be required to prevent the kitchen from causing odour nuisance impacts. The following sections of this report outline each part of the risk assessment in relation to the proposed unit.

2.4 It should be noted that where assumptions have been made within this risk assessment, these are clearly stated and are based on the professional experience of 1st Aurora Ltd.

Dispersion

2.5 The risk rating for dispersion relates to the conditions under which kitchen extraction emissions are discharged. The relevant risk ratings described in the guidance are shown below. The risk score is shown in parentheses.

- VERY POOR (20) – Low level discharge, discharge into courtyard, or restriction on stack;
- POOR (15) – Discharge not low level, but below eaves, or discharge rate below 10 m/s;
- MODERATE (10) – Discharging 1 m above eaves at a rate of 10-15 m/s;
- GOOD (5) – Discharging 1 m above ridge at a rate of 15 m/s or more.

2.6 Air extracted from the basement level kitchen and pods 3, 4 and 5 of the proposed unit will be emitted to the atmosphere via a vertical duct, which will terminate within the external plant area approximately 4 metres above floor level. The velocity of the discharge on the basement kitchen system is approximately 12m/s and approximately 14m/s on the system serving pods 3, 4 and 5.

The risk rating for dispersion for the above systems is described as MODERATE.

Air extracted from pod 2 (pizza pod) and pod 6 & 7 will be emitted to the atmosphere via louvre connections on the Sadlers Yard elevation. The velocity of the discharge on the pod 2 system is approximately 2.5m/s and approximately 6.5m/s on the system serving pods 6 & 7.

The risk rating for dispersion for the above systems is described as POOR.

Proximity to Receptors

2.7 The risk rating for proximity to receptors relates to the distance between the point of discharge of kitchen emissions and the nearest sensitive receptor locations. Sensitive receptor locations may be residential properties, commercial premises or frequently used public open spaces. The relevant risk ratings described in the guidance are shown below. The risk score is shown in parentheses.

- CLOSE (10) – Closest sensitive receptor is less than 20 m from kitchen discharge;
- MEDIUM (5) – Closest sensitive receptor is between 20 and 100 m from kitchen discharge;
- FAR (1) – Closest sensitive receptor is more than 100 m from kitchen discharge.

2.8 The risk rating for the proximity to residential properties on the Sadlers Yard elevation is judged to be CLOSE. The closest sensitive receptors are approximately 10 m away in Redfern Building, the usage of the building on the lower floors is currently office & leisure space.

The risk rating for the proximity to residential properties on the Mayes Street elevation is judged to be MEDIUM. The closest sensitive receptors are approximately 30 m away.

Size of Kitchen

2.9 The risk rating for size of kitchen relates to the volume of food prepared by the kitchen and is described in terms of the capacity of the restaurant or take-away. The relevant risk ratings described in the guidance are shown below. The risk score is shown in parentheses.

- LARGE (5) – More than 100 covers or a large-sized take-away;
- MEDIUM (3) – Between 30 and 100 covers or a medium-sized take-away;
- SMALL (1) – Less than 30 covers or a small take-away.

2.10 Based on discussions with the management and end users of the space, it is judged that the most appropriate risk rating for usage of each pod and kitchen is LARGE (over 100 meals per day).

Cooking Type and Grease Loading

2.11 The risk rating for cooking type and grease loading relates to the type of cooking methods employed in the kitchen and the type of food prepared. The relevant risk ratings described in the guidance are shown below. The risk score is shown in parentheses.

- VERY HIGH (10) – Pubs (those serving a high level of fried food), fried chicken, burgers or fish and chips;
- HIGH (7) – Kebab, Vietnamese, Thai or Indian;
- MEDIUM (4) – Cantonese, Japanese or Chinese;
- LOW (1) – Most pubs, Italian, French, Pizza or Steakhouse.

2.12 It is intended that the unit will be occupied by various different vendors, cooking a variety of meals within the cooking pods:

Sadlers Yard elevation

Pod 2- Pizza

Pod 6- Sushi

Pod 7- Grilled meats

The risk rating would be classified as MEDIUM risk for cooking type.

Mayes Street elevation

Pods- Vietnamese, Japanese, Gourmet Sandwiches

Production kitchen- cooking of sauces for each pod

The risk rating would be classified as LOW risk for cooking type.

Risk Assessment Summary

2.13 The odour risk assessment summary for the proposed Sadlers Yard elevation is shown in Table 1.

Table 1

Sadlers Yard Odour Risk Assessment Summary Criteria	Risk Rating	Risk Score 1	Description	Comments
Dispersion	Poor	15	Discharge not low but below eaves	Discharge through ductwork approx. 4 metres above floor level at between 12-14m/s.
Proximity to receptors	Close	10	Closest adjacent sensitive receptors are 10 m from kitchen discharge.	Receptors are below roof (and thus discharge) level.
Size of Kitchen	Large	5	More than 100 meals per day.	Pods expected to serve 100 meals per day.
Cooking Type and Grease Loading	Med	4	Most pubs, Italian, French, Pizza or Steakhouse	The intended use of each pod is classed as medium grease levels.
TOTAL RATING	High	34		A high level of odour abatement required.

Total Risk Score of <20 = Low to Medium Risk, 20 to 35 = High Risk; and >35 = Very High Risk.

2.14 The overall odour risk rating of the unit is 'Low to Medium Risk' (based on a risk score of 19). This denotes that it would require a low to medium level of odour control to eliminate the risk of odour impacts for nearby residential properties.

2.15 The intended use of the pods on Sadlers Yard is for 3no. vendors to cook a variety of different foods. Based on the Defra risk assessment, if it is assumed that the score would be 34, which represents a 'High' risk of odour impacts. This is taken into account in the discussion on odour abatement in the following section of this report.

2.16 The odour risk assessment summary for the proposed Mayes Street elevation is shown in Table 2.

Table 2

Mayes Street Odour Risk Assessment Summary Criteria	Risk Rating	Risk Score 1	Description	Comments
Dispersion	Moderate	10	Discharge 1m above eaves at a rate of 10-15m/s	Discharge through louvres at no greater 6.5m/s
Proximity to receptors	Medium	5	Closest adjacent sensitive receptors are 30 m from kitchen discharge.	Receptors are below roof (and thus discharge) level.
Size of Kitchen	Large	5	More than 100 meals per day.	Pods expected to serve 100 meals per day.
Cooking Type and Grease Loading	Low	1	Most pubs, Italian, French, Pizza or Steakhouse	The intended use for pods 3,4 & 5 and production kitchen is low grease levels.
TOTAL RATING	Medium	21		A medium level of odour abatement required.

Total Risk Score of <20 = Low to Medium Risk, 20 to 35 = High Risk; and >35 = Very High Risk.

2.17 The overall odour risk rating of the unit is 'Low to Medium Risk' (based on a risk score of 21). This denotes that it would require a low to medium level of odour control to eliminate the risk of odour impacts for nearby residential properties.

2.18 The intended use of the pods on Mayes Street is for 3no. vendors to cook a variety of different foods. Based on the Defra risk assessment, if it is assumed that the score would be 21, which represents a 'Medium' risk of odour impacts. This is taken into account in the discussion on odour abatement in the following section of this report.

3 Recommended Odour Abatement System

3.1 This section of the report briefly outlines the odour control measures that would need to be installed on the kitchen extract system at the proposed unit to provide optimal odour abatement and minimise the risk of odour impacts at surrounding properties.

3.2 The odour risk assessment has identified a high risk of odour impacts from the operation of the cooking pods on Sadlers Yard elevation. The odour abatement measures set out below therefore consider a high risk use.

3.3 The odour control measures suggested within Defra's guidance on odours from commercial kitchens (Defra, 2005) for kitchens with a 'High' odour risk assessment score include:

1. *Fine filtration or ESP1.*
2. ESP = Electrostatic Precipitation. This is a form of fine particulate filtration that does not involve fibre filters.
3. *Fine filtration followed by counteractant/neutralising system to achieve the same level of control as 1.*

3.4 The odour control measures suggested within Defra's guidance on odours from commercial kitchens (Defra, 2005) for kitchens with a 'High' odour risk assessment score include:

1. *Fine filtration or electrostatic precipitation (ESP) followed by carbon filtration (carbon filters rated with a 0.2-0.4 second residence time).*
2. *Fine filtration or ESP followed by UV ozone system to achieve the same level of control as 1.*

3.5 It is recommended that rather than installing a 'one-size-fits-all' odour abatement system to cover any potential use of the unit, the abatement system is designed to be commensurate to the intended use of the unit on first occupation. This may require an upgrade to the system in the future, if, for example, the unit were to be initially occupied by a coffee shop, but later occupied by an Indian restaurant.

3.6 Uses of the proposed unit which would require a **low to medium** level of odour abatement include: coffee shop, sandwich bar, Italian restaurant, French restaurant, steakhouse, pub, or pizza restaurant.

3.7 Uses of the proposed unit which would require a **high** level of odour abatement include: Indian, Chinese, Vietnamese, Thai, Turkish, Lebanese, Cantonese, Nepalese, or Japanese restaurants,

burger restaurant, fish & chip shop, kebab house, fried chicken take-away or any other use with a high level of fried food.

3.8 It is the intention and preference of the applicant to ensure a bar / restaurant type business occupies the proposed unit. In any case, once an occupier is identified, a suitable odour abatement system will be specified. If the end user of the unit is any of the kitchen types described in paragraph 3.6, then an abatement system meeting the requirements set out in paragraph 3.3 will be installed. If the end user of the unit is any of the kitchen types described in paragraph 3.7, then an abatement system meeting the requirements set out in paragraph 3.4 will be installed.

3.9 Any future change of tenant from a low-risk to high-risk kitchen type will involve an upgrade to the odour abatement system to meet the requirements of paragraph 3.4.