

MILLER GOODALL
ACOUSTICS AND AIR QUALITY

COMMERCIAL KITCHEN ODOUR RISK ASSESSMENT

on behalf of

EG GROUP LTD

for

BOLDON NORTH ROAD, BOLDON COLLIERY, NEWCASTLE UPON TYNE NE35 9AR

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Summary

This assessment has been undertaken to accompany a planning application for a proposed drive-thru unit at Boldon North Road, Boldon Colliery, Newcastle upon Tyne NE35 9AR.

A commercial kitchen odour risk assessment has been undertaken which has concluded that a very high level of odour control is required for the development. Therefore, appropriate mitigation measures have been outlined along with recommended installation and maintenance requirements to ensure the system remains efficient and in good condition.

With the implementation of appropriate mitigation, there is no reason for this application to be refused on the grounds of odour.

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1 Introduction

1.1 This air quality assessment has been undertaken to accompany a planning application for a drive-thru unit at Boldon North Road, Boldon Colliery, Newcastle upon Tyne NE35 9AR. The site lies within the administrative boundary of South Tyneside Council (STC).

1.2 There are a number of factors that influence the magnitude of an odour problem, these include:

- size of the cooking facility – influences the intensity of the odour;
- type of food being prepared – affects the chemical constituents within the ventilation air;
- type of cooking appliances used – which the level of fat, water droplets and temperature within the ventilation air; and
- the location of the premises.

1.3 The report also provides a commercial kitchen risk assessment and review of the odour associated with the proposed development, in accordance with established guidance from EMAQ+[1].

2 Site Description

2.1 The proposed development is located within Boldon Colliery which is a village northwest of Sunderland and southeast of Newcastle upon Tyne. The proposed development is located within the Boldon Colliery Asda supermarket car park.

2.2 Henley Way is located to the north of the site, beyond this road there are residential dwellings. These are the closest sensitive receptors, which are approximately 50 m north of the site. The Asda car park surrounds the site to the east and the south. To the west of the site is the car park associated with Cineworld and various restaurants.

2.3 The site location is shown in **Appendix A**.

3 Proposed Development

3.1 The proposed development consists of a commercial drive-thru unit that will replace a section of the existing car parking spaces at the Asda supermarket.

3.2 As any cuisine could be prepared within the unit, a worst-case cuisine type of fried fast food has been assessed within the kitchen odour risk assessment.

[1] EMAQ+ (2018) *Control of Odour and Noise from Commercial Kitchen Exhaust Systems.*

4 Policy Context

4.1 National Planning Policy Framework

4.1.1 The National Planning Policy Framework[2] (NPPF) does not specifically mention odour, but it does refer to air and pollution. Paragraph 174 states:

"Planning policies and decisions should contribute to and enhance the natural and local environment by:

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

4.1.2 The role of planning is to ensure that new developments that are capable of creating odour do not cause a significant adverse effect in the local area or impact upon existing sensitive uses nearby. Additionally, the planning system also seeks to ensure sensitive uses introduced at the development would not be adversely affected by existing odorous sources and/or that undue restrictions are not placed on existing odorous businesses that may have operated up to that point without issue.

5 Methodology

5.1 EMAQ+ Risk Assessment Methodology - Odour Control

5.1.1 The EMAQ+ guidance includes a risk assessment methodology for odour associated with commercial kitchens, the outcome of which determines the level of odour control required. The risk assessment works on a scoring system based on the sum of the contributions from dispersion, the proximity of receptors, size of kitchen and cooking type. This score is then used to determine the impact risk and level of odour control required, as detailed in **Table 1.**

Table 1: Determining a Score for Odour Control

Impact Risk	Odour Control Requirement	Significance Score
Low to Medium	Low Level odour control	<20
High	High Level Odour Control	20-35
Very High	Very High Level Odour Control	>35

5.1.2 **Table 2** shows different measures that can be implemented to achieve the level of odour control required. Maintenance must be regularly carried out to ensure that the performance levels are always achieved.

[2] Ministry of Housing, Communities and Local Government (MHCLG) (2021) National Planning Policy Framework

Table 2: Odour Control

Level of Control		
Low to Medium	**High**	**Very High**
1. Fine filtration or electrostatic Precipitator (ESP) followed by carbon filtration (carbon filters rated with 0.1 second residence time).	1. Fine filtration or ESP followed carbon filtration (carbon filters rated with 0.2-0.4 second residence time).	1. Fine filtration or ESP followed carbon filtration (carbon filters rated with 0.4-0.8 second residence time). 2. Fine filtration or ESP followed by counteractant/neutralising system to achieve the same level of control as 1.
2. Fine filtration followed by counteractant/neutralising system to achieve the same level of control as 1.	2. Fine filtration or ESP followed by ultraviolet (UV) ozone system to achieve the same level of control as 1.	3. Fine filtration or ESP followed by UV ozone system to achieve the same level of control as 1.

6 Commercial Kitchen Odour Risk Assessment

6.1 The risk assessment completed for the proposed kitchen extraction system for the development is shown in **Appendix B**. The resulting significance score has been considered in conjunction with **Table 1** to determine the level of odour control required.

6.2 The food type with the highest odour potential (fried foods) has been assessed to provide a worse case assessment. The kitchen has been classed as a large-sized takeaway. The closest sensitive receptors are located between 20 and 100 m from the proposed new building.

6.3 The kitchen ventilation flue will discharge at the façade of the building, resulting in a 'Poor' dispersion. Mitigation to ensure a very high level of odour control has been selected and is outlined in the associated planning submission documentation by the appointed mechanical and engineering consultancy, Ashworth.

6.4 The resulting significance score is **35**. The risk assessment concludes that a **very high** level of odour control is required for this type of food preparation. Using the data provided in **Table 2**, a **very high** level of odour control should include the implementation of one of the following methods:

- Fine filtration or ESP followed by carbon filtration (carbon filters rated with 0.4-0.8 seconds residence time);

  or

- Fine filtration or ESP followed by counteractant/neutralising system to achieve the same level of control as bullet point 1 above.

  or

- Fine filtration or ESP followed by UV ozone system to achieve the same level of control as bullet point 1 above.

6.5 Emaq+ guidance advises that the design and maintenance of the kitchen extraction system is an important factor Minimum design performance criteria and maintenance criteria are provided in **Appendix C.**

7 Mitigation

7.1 The ventilation and kitchen odour mitigation has been designed by the appointed mechanical and engineering consultancy, Ashworth.

7.2 The proposed development will include two electrostatic preceptors followed by three ultraviolet injector units. The implementation of this mitigation equipment will ensure odour is controlled and mitigated to a very high risk rating, as per the requirements of the EMAQ+ Guidance. The system has been overdesigned (i.e. more than 1 of each unit) to ensure a very high level of odour control beyond the requirements of the guidance; to ensure no adverse odour effects occur during the operational phase.

8 Summary of Impacts and Conclusion

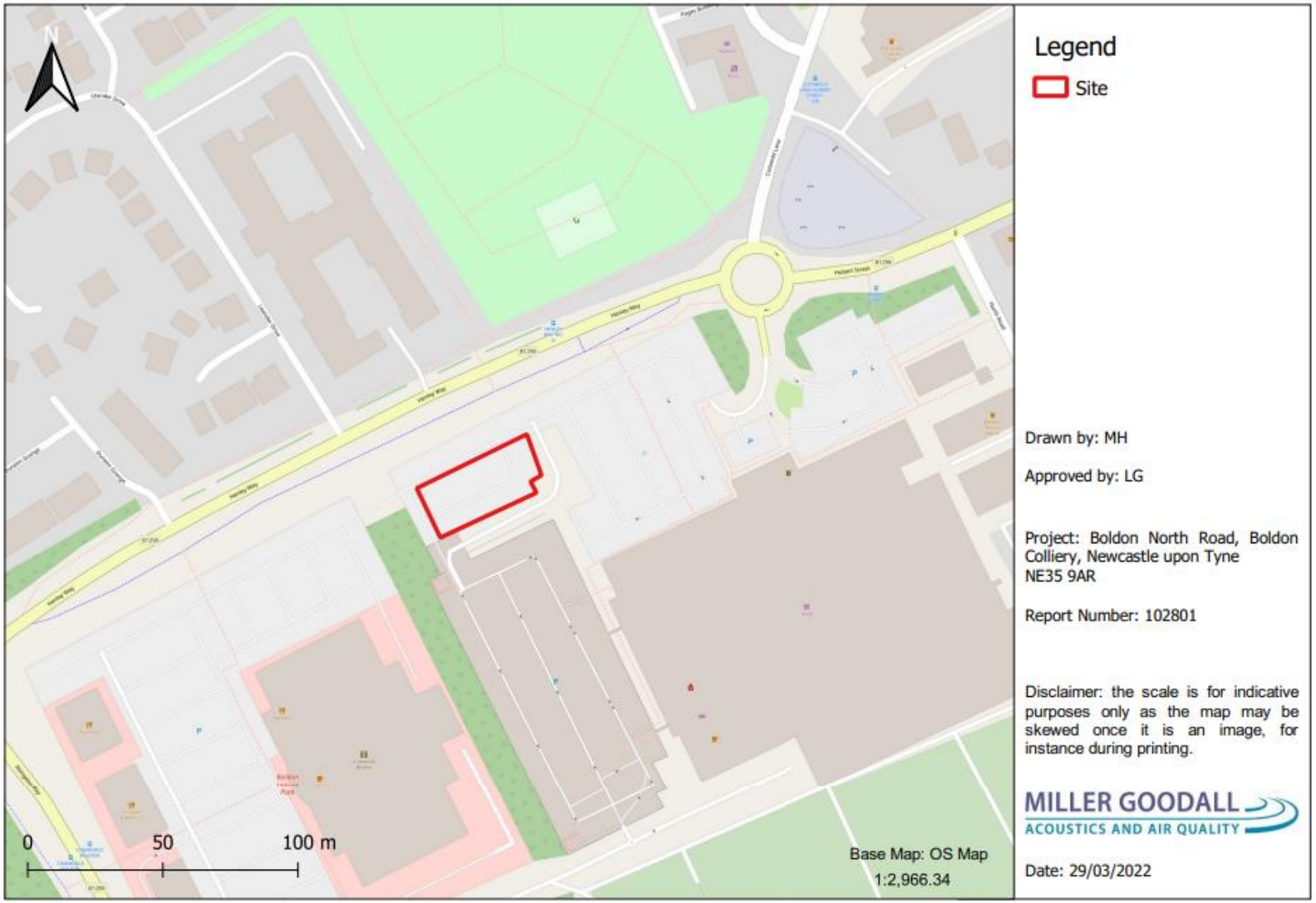
8.1 The commercial kitchen odour risk assessment indicates that a very high level of odour control is required within the development. Therefore, appropriate mitigation measures have been outlined along with recommended installation and maintenance requirements to ensure the system remains efficient and in good condition.

8.2 With the implementation of the mitigation, there is no reason for this application to be refused on the grounds of odour.

APPENDICES

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Appendix A: Site location



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Appendix B: Risk Assessment for Cooking Odour

Criteria		Score	Details
Dispersion	Very poor	20	Low level discharge, discharge into courtyard or restriction on stack.
	Poor	**15**	Not low level but below eaves, or discharge at below 10 m/s.
	Moderate	10	Discharging 1m above eaves at 10 -15 m/s
	Good	5	Discharging 1m above ridge at 15 m/s
Proximity of receptors	Close	10	Closest sensitive receptor less than 20m from kitchen discharge.
	Medium	**5**	Closest sensitive receptor between 20 and 100m from kitchen discharge.
	Far	1	Closest sensitive receptor more than 100m from kitchen discharge
Size of kitchen	Large	**5**	More than 100 covers or large sized take away.
	Medium	3	Between 30 and 100 covers or medium sized take away
	Small	1	Less than 30 covers or small take away.
Cooking type (odour and grease loading)	Very high	**10**	Pub (high level of fried food), fried chicken, burgers or fish & chips
	High	7	Kebab, Vietnamese, Thai or Indian
	Medium	4	Cantonese, Japanese or Chinese.
	Low	1	Most pubs, Italian, French, Pizza or steakhouse.
Total Score		**35**	**A very high level of odour control is required.**

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Appendix C: Design and Maintenance Requirements

Minimum Requirements for Odour Control

- Positioning of the stacks as far as possible from the nearest residential dwellings;
- Use of Chinaman's hats or other cowls should not be permitted;
- Consideration of the prevailing wind direction in relation to the ducting positioning;
- Ducting should be rigid in construction and resiliently mounted; and

Recommendations for Cleaning

The recommended cleaning period for grease extraction ductwork is

Grease loading		Daily usages	Cleaning intervals(months)
Heavy use	Heavy/continuous grease production	6-12 hours 12-16 hours	3-6 months 2-3 months
Moderate use	Moderate grease production	6-12 hours 12-16 hours	6-12 months 3-4 months
Light use	No significant grease production	6-12 hours 12-16 hours	12 months 6 months

Recommendations for Maintenance

System employing fine filtration and carbon filtration;

- change filters every two weeks (or to product manufacturers recommendation);
- change carbon filters every 4 to 6 months (or to product manufacturers recommendation).

Using a system employing ESP and other inline abatement, typically;

- ESP systems cleaned and sump emptied on a four weekly basis;
- UV-C systems used inline, cleaned on a four weekly basis;
- Side stream UV-C systems, cleaned every 3 to 6 months
- Carbon filters with ESP pre-treatment change carbon filter every 6 to 12 months

These time frames may increase or reduce for extreme or very light applications.

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Glossary of Terms

Effects The consequences of the changes in airborne concentration and/or dust deposition for a receptor. These might manifest as annoyance due to soiling, increased morbidity or morality due to exposure to PM_{10} or $PM_{2.5}$ or plant dieback due to reduced photosynthesis. The term 'significant effect' has a specific meaning in EIA regulations. The opposite is an insignificant effect. In the context of construction impacts any effect will usually be adverse, however, professional judgement is required to determine whether this adverse effect is significant based in the evidence presented.

Impacts The changes in airborne concentrations and/or dust deposition. A scheme can have an 'impact' on airborne dust without having any 'effects', for instance if there are no receptors to experience the impact.

NPPF National Planning Policy Framework


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