



Acoustic Survey and Odour Assessment for Proposed Take-away at 301 Cutgate Shopping Prescient, Edenfield Road, Rochdale, OL11 5AQ.

Prepared for:

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1. Introduction

- 1.1. Martin Environmental Solutions has been commissioned to undertake an acoustic assessment to support a planning application for a conversion of a commercial unit to a take-away and the erection of a flue at 301 Cutgate Shopping Precinct, Edenfield Road, Rochdale, OL11 5AQ. Planning ref: 22/00134/FUL.

Site Location and Context

- 1.2. The development site is situated to the south of Edenfield Road, within the Cutgate shopping Precinct. The unit is located in the centre of the development with a number of commercial units either side. A number of which currently have external plant operating. To the rear of the site is a delivery access road and beyond residential properties.
- 1.3. An aerial Photograph is enclosed in Figure 1.
- 1.4. This report has been requested by the Council following concerns over the potential impact on neighbouring land uses.



2. Policy and Guidance

Noise

- 2.1. The impact of noise can be a material consideration in the determination of planning applications. The planning system has the task of guiding development to the most appropriate locations. It is recognised that on occasions it will be difficult to reconcile some land uses, such as housing, hospitals, or schools, with other activities that generate high levels of noise. However, the planning system is tasked to ensure that, wherever practicable, noise-sensitive developments are separated from major sources of noise (such as road, rail and air transport and certain types of industrial development).
- 2.2. The Government's publication of the National Planning Policy Framework (NPPF), updated in July 2021, states that planning policies and decisions should prevent new and existing development from contributing to or being put at unacceptable risk from, of being adversely affected by unacceptable levels of noise pollution.
- 2.3. The Government have also issued the Noise Policy Statement for England (NPSE). The NPSE clarifies the Government's underlying principles and aims in relation to noise and sets a vision to promote good health and a good quality of life through the effective management of noise while having regard to the Government's sustainable development strategy. The NPSE aims to mitigate and minimise adverse impacts on health and quality of life through the effective management and control of noise.
- 2.4. The NPSE introduces the following terms, although no sound levels are given to represent these, many authorities have identified the sound level criteria in line with the World Health Organisation, BS8233:2014 and BS4142: 2014 levels. The terms introduced by the NPSE are:

NOEL – No Observed Effect Level (<30dB(A) inside <50dB(A) outside, 10dB below background)
LOAEL – Lowest Observed Adverse Effect Level (30-35dB(A) inside 50-55dB(A) outside, background to +5dB)
SOAEL – Significant Observed Adverse Effect Level (>35dB(A) inside, >55dB(A) outside, >+10dB above background)
- 2.5. The sound levels within the brackets of the previous paragraph are those determined as appropriate levels to indicate the relevant effect levels represented by the NPSE.



- 2.6. Other commonly used examples of standards utilised by Local Planning authorities for the consideration of noise impacts include comparison of the likely noise levels to be experienced at a development, with levels that have been recommended by the World Health Organisation (WHO) as Guidelines for the prevention of Community Noise Annoyance and within BS8233: 2014.
- 2.7. The WHO recommended noise levels for outdoor amenity areas (gardens) that should not be exceeded are 55dB(A) $L_{Aeq,16hr}$ in order to avoid 'Serious Community Annoyance' or 50dB(A) $L_{Aeq,16hr}$ to avoid 'Moderate Community Annoyance' during the day. For indoor levels WHO set 35dB(A) $L_{Aeq,16hr}$ during the day to prevent Moderate Annoyance and 30 dB(A) $L_{Aeq,8hr}$ at night to prevent sleep disturbance.
- 2.8. The WHO guidance also recommends that maximum sound levels at night should not regularly exceed 45dB(A) within bedrooms to prevent sleep disturbance. Regularly is considered to be more than 10 times during any 8-hour night-time period.
- 2.9. BS 8233:2014 'Guidance on sound insulation and noise reduction for buildings' also specifies desirable noise levels to be achieved inside dwellings.
- 2.10. BS 8233:2014 'Sound insulation and noise reduction for buildings – Code of Practice' also specifies desirable noise levels to be achieved inside dwellings. BS 8233 presents two levels, the first between the hours of 07:00 – 23:00 and the second between 23:00 -07:00.
- 2.11. The daytime period suggests internal noise levels of 35dB $L_{Aeq,16hr}$, for resting in living rooms and bedrooms while for night-time a level of 30dB $L_{Aeq,8hr}$ is recommended. Criteria for external areas mirrors that within the WHO guidance.
- 2.12. Another commonly used standard is British Standard 4142:2014 'Method for rating industrial and commercial sound' compares the sound predicted by the source in question against the background, L_{A90} sound levels.



- 2.13. The "residual" L_{Aeq} measurement is then subtracted from the "ambient" L_{Aeq} measurement (with the sound source) to calculate the sound level created by the "problem" sound alone -termed the "specific" sound level.
- 2.14. If the "problem" sound is tonal, such as whine or hum, or if it is impulsive such as bangs or clatters or if it is irregular enough to attract attention a correction is added to the "specific level" to produce the "rating level". The "background" L_{A90} measurement is then compared against the "rating level".
- 2.15. If the "rating level" exceeds the "background" by around 10dB(A) or more this "indicates a significant adverse impact". A difference of around 5dB(A) 'indicates an adverse impact. The lower the commercial noise level is, the lower the likely impact. In addition, the published 'ProPG Planning & Noise, Professional Practice Guidance on Planning & Noise, New Residential Development' provides a 4-staged approach to undertaking a risk assessment in relation to anticipated sound levels at new residential development and the provision of mitigation measures. The guidance is principally aimed at sites exposed predominantly to noise from transportation sources.
- 2.16. In addition, the 'ProPG Planning & Noise, Professional Practice Guidance on Planning & Noise, New Residential Development' provides a 4-staged approach to undertaking a risk assessment in relation to anticipated sound levels at new residential development and the provision of mitigation measures. The guidance is principally aimed at sites exposed predominantly to noise from transportation sources.
- 2.17. The first stage consists of an initial noise risk assessment, based on indicative day and night-time *noise* levels. Simply put, the higher the ambient noise in an area the greater the impact. The levels given are shown below although it should be noted that these are in excess of both the Lancashire guidance, WHO and BS 8233: 2014.

Noise Risk Category*	Potential Effect if Unmitigated	Pre-Planning Application Guidance
0 – Negligible $L_{Aeq,16hr} < 50dB$ $L_{Aeq,8hr} < 40dB$	May be noticeable but no adverse effect on health and quality of life	In this category the development is likely to be acceptable from a noise perspective, nevertheless a good acoustic design process is encouraged to improve the existing environment and/or safeguard against possible future deterioration and to protect any designated tranquil areas. A noise assessment may be requested to demonstrate no adverse impact from noise. Application need not normally be delayed on noise grounds.
1 – Low $L_{Aeq,16hr} 50-63dB$ $L_{Aeq,8hr} 40-55dB$	Adverse effect on health and quality of life	In this category the development may be refused unless a good acoustic design process is followed and is demonstrated via a Level 1 Acoustic Design Statement which confirms how the adverse impacts of noise on the new development will be mitigated and minimised and that a significant adverse impact will not arise in the finished development. Planning conditions and other measures to control noise may be required.
2 – Medium $L_{Aeq,16hr} 63-69dB$ $L_{Aeq,8hr} 55-60dB$ $L_{AFmax} > 80dB^{**}$	Significant adverse effect on health and quality of life	In this category the development is likely to be refused unless good acoustic design process is followed and is demonstrated via a Level 2 Acoustic Design Statement which confirms how the adverse impacts of noise on the new development will be mitigated and minimised, and clearly demonstrates that a significant adverse noise impact will not arise in the finished development. Planning conditions and other measures to control noise will normally be required.
3 – High $L_{Aeq,16hr} > 69dB$ $L_{Aeq,8hr} > 60dB$ $L_{AFmax} > 80dB^{**}$	Unacceptable adverse effect of health and quality of life	In this category the development is very likely to be refused on noise grounds, even if a good acoustic design process is followed and is demonstrated via a Level 2 Acoustic Design Statement. Applicants are advised to seek expert advice on possible mitigation measures. Advice on the circumstances when the refusal of a new housing on noise grounds should normally be anticipated is included in the ProPG.

2.18. Stage 2, consists of a full assessment of the prevailing ambient noise and requires 4 elements to be considered:

- I. Element 1 – Good Acoustic Design
- II. Element 2 – Internal Noise Level Guidelines
- III. Element 3 – External Amenity Area Noise Assessment
- IV. Element 4 – Assessment of Other Relevant Issues

2.19. A good acoustic design is implicit in meeting the requirements of the NPPF and can help to resolve many potential acoustic issues.

2.20. Details of the criteria considered suitable are provided above for both internal and external sound levels. Element 4 includes such issues as local and national policy, likely occupants, wider planning objectives.



Odour

- 2.21. The Government sets out its policy in relation to planning in the National Planning Policy Framework (NPPF). The NPPF states that planning policies and decisions should “preventing 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”; and “In preparing plans to meet development needs, the aim should be to minimise pollution and other adverse effects on the local and natural environment”
- 2.22. While Odour is not specifically mentioned in is implied by the above and the Planning Practice Guidance (PPG) note issued by the government on Air Quality states “odour and dust can also be a planning concern, for example, because of the effects on local amenity” it continues to state, “mitigation options where necessary, will depend on the proposed development and should be proportionate to the likely impact”.
- 2.23. Before an odour can be present an adverse effect, there must be exposure to the odour and therefore a source, a pathway, and a receptor without these three links no exposure can occur. In the case of this application the source is the take-away. The pathway is the air, and the receptor are the occupants of the nearby existing dwellings.
- 2.24. In assessing the impact of odour on or from a development the scale of the exposure and therefore impact is determined by the parameters collectively known as the FIDO factors (Frequency, Intensity, Duration and Offensiveness) In addition the sensitivity of the receptor (location) will determine the magnitude of the exposure. Factors that influence the magnitude of a commercial odour problem include the size/volume of the cooking facility, the type of food being prepared, and the type of cooking appliances being used.
- 2.25. Furthermore, new and updated guidance on assessing the impact of extraction systems from commercial kitchens has been published by EMAQ ‘*Control of Odour and Nose from Commercial Kitchen Extraction Systems*’. This is a revision of the 2005 guidance document ‘*Control of Odour and Nose from Commercial Kitchen Extraction Systems*’ produced by NETCEN and DEFRA which has been withdrawn.



2.26. This document details a methodology which should be followed to assess the potential impact from commercial kitchen extraction systems on nearby land uses and how to identify suitable control and mitigation measures as required.



3. The Assessment

Noise

- 3.1 Martin Environmental Solutions have recently (April 2022) undertaken sound monitoring in the vicinity of the site for another application. Given the lack of changes since this work in the area and the location being adjacent to the monitoring point the same data set has been used as being representative for the area.
- 3.2 The monitoring was undertaken over the 20th-21st April 2022. The meter, a Cirrus Optimus Green CR:171B meter, was set up to the rear of the adjacent site, 303 Cutgate at a first floor / roof level.
- 3.3 The weather at the time of the monitoring was dry, with little wind. The meter was field calibrated before and after the measurements with no significant deviation. Full laboratory calibration certificates are available on request.
- 3.4 The full measurements area available in Appendix A with a summary in the table below.

Start Time	End Time	Duration	L _{Aeq}	L _{A90}	L _{AMax}
20/04/2022 08:00	20/04/2022 23:00	14:59:58	66.3	46.4	94.4
20/04/2022 23:00	21/04/2022 07:00	08:00:00	47.1	39.1	69.6
21/04/2022 07:00	21/04/2022 08:00	01:00:01	53.2	50.0	71.4

- 3.5 The development at 303 Cutgate consisted of an extraction unit and suitable attenuators were proposed to reduce any impact to below the background sound level, 33.7 dB(A).
- 3.6 The proposed development at 301 Cutgate will include an extraction system and the with a recommended Flaktwood 45JM/16/4/5/30 fan. Sound emission data has been obtained from the manufacturer. This has been used to determine the sound level at the nearest sensitive property, 17m away.
- 3.7 The sound level from the flue will result in sound levels of 46.4dB(A). This is above the background sound level and as such additional attenuation will be required to reduce the sound at the receptor.
- 3.8 A BDER-40-120 silencers will reduce the sound level down to 26.6dB(A).



3.9 This will below the prevailing background sound level in the area.

3.10 A BS4142:2014 assessment has also been undertaken based on the use of the two silencers.

	Day	Night (up to midnight)	
Measured Ambient sound level	L _{Aeq} = 66.3dB	L _{Aeq} = 47.0dB	Measured on site
Residual Sound level	L _{Aeq} = 66.3dB	L _{Aeq} = 47.0dB	
Background Sound Level	L _{A90} = 46.4dB	L _{A90} = 42.7dB	Measured on site
Reference period	60 minutes	15 minutes	Normal ref period,
Specific sound Level	L _{Aeq} = 26.6dB	L _{Aeq} = 26.6dB	Calculated
Acoustic feature	-	-	No correction applied
Rating level	26.6dB	26.6dB	
Background sound level	L _{A90} = 46.4dB	L _{A90} = 42.7dB	
Excess of Rating level over background level	(26.6-46.4) dB = -19.8dB indicates no significant adverse impact	(26.6-42.7) dB = -16.1dB indicates no significant adverse impact	
Uncertainty			An additional extraction unit has been installed next door which, if anything, would increase the background noise level.

3.11 The BS4142:2014 assessment indicates that with the provision of the silencer the extraction system will not result in any adverse impact on the nearby residential development.



Odour

- 3.12 The proposed extraction system is located toward the rear of the development, and will terminate above the ridge of the building. The nearest residential property being to the rear 17m away.
- 3.13 The development is small in size, serving low numbers of guests each day.
- 3.14 Prevailing wind direction for the area, obtained from the Middleton weather station, Appendix D, is westerly. This would carry any odours away from the nearest residential properties to the rear.
- 3.15 The EMAQ document identifies a number of control measures to avoid odour emissions from commercial kitchens becoming a problem. The document lists the various control measures available and identifies minimum standards to ensure odour emissions will not create a problem to neighbouring land uses. 'Appendix 3' of the document identifies a risk assessment to assess the impact and control measures required, and this will be used as the basis of this assessment.
- 3.16 The following are included within the extraction design:
- The extraction system will terminate above the ridge of the building. The system will be fitted with a jet cowl, with a velocity above 10m/s, in line with the guidance a score of 5 is applied.
 - The nearest residential receptor is located within 20m away, as such a score of 10 is applied.
 - The business has identified as "small", and therefore score 1 has been applied.
 - The odour characteristics from the venue are considered to be very high, in line with the guidance document a scoring of 10 is applied.
- 3.17 Based on the above parameters the risk assessment has been conducted, see Appendix E, and has identified a high potential odour impact risk.
- 3.18 In order to mitigate against this potential impact and to ensure no adverse impact, in line with the guidance, the following measures are recommended as part of the extraction system.
- Prefilters (baffle filters) attached to the extraction hood in the frying range



- Secondary grease filter in the extraction flue to remove additional grease from the air
- To remove odour from the extracted air either an activated carbon filter with a designed 0.2s contact time to remove odour

3.19 Alternatively, to minimise ongoing maintenance costs the activated carbon filter can be changed for an ozone system.

3.20 The system will need to be maintained and cleaned in line with the manufacturer's instructions and a separate cleaning schedule will be produced and maintained once the chosen unit has been installed.

3.21 The installation of the above mitigation measures will ensure suitable removal of grease and odour from the extraction system. The height of the flue and use of an accelerator jet cowl will further ensure that should any odours not be treated they will be directed vertically into the atmosphere for dilution without affecting the adjacent or any other nearby properties.



4 Conclusion

Noise

- 4.1 Previous on-site monitoring has identified existing background sound levels and these have been used to assess the impact of the proposed extract system on the nearby residential properties.
- 4.2 It has been identified that the system will result in an adverse impact on those properties and as such additional mitigation measures are required.
- 4.3 These have been identified as a Flaktwood BDER-40040-120 silencer to be fitted to fan thus reducing the sound levels to below the prevailing background level on site.

Odour

- 4.4 An odour assessment has been undertaken in line with the EMAQ/CIEH “Control of Odour and Noise from Commercial Kitchen Exhaust Systems”. This has identified a high potential for odour to impact on nearby residents and as such mitigation measures have been identified in the form of grease removal and odour treatment within the extraction system.
- 4.5 The inclusion of the above mitigation measures to all habitable rooms will ensure that the internal and external sound levels are acceptable and will result in a No Observe Effect on the future residents in line with the Noise Policy Statement for England.
- 4.6 As such the development will meet the objectives of the National Planning Policy Framework in ensuring that no significant adverse impact is experienced by the future residents. The development is therefore considered to be acceptable in terms of noise.

Figure 1 – Aerial Photograph





Appendix A – Full Monitoring Results

Time	L _{Aeq} (dB)	L _{AMax} (dB)	L _{A90} (dB)
20/04/2022 08:00	54.7	74.4	50.3
20/04/2022 09:00	51.3	73.3	47.9
20/04/2022 10:00	53.0	77.7	47.0
20/04/2022 11:00	52.8	81.5	46.7
20/04/2022 12:00	53.0	78.8	46.7
20/04/2022 13:00	51.3	75.1	46.5
20/04/2022 14:00	51.3	73.9	46.8
20/04/2022 15:00	61.3	94.4	48.3
20/04/2022 16:00	61.5	92.4	48.4
20/04/2022 17:00	67.9	91.0	48.1
20/04/2022 18:00	77.2	93.3	47.5
20/04/2022 19:00	51.8	78.4	46.2
20/04/2022 20:00	51.1	77.3	45.1
20/04/2022 21:00	48.5	67.1	44.6
20/04/2022 22:00	48.4	59.5	44.8
20/04/2022 23:00	47.1	64.4	42.5
21/04/2022 00:00	44.6	66.6	39.2
21/04/2022 01:00	43.0	67.7	38.5
21/04/2022 02:00	41.3	55.4	38.5
21/04/2022 03:00	42.0	60.0	38.3
21/04/2022 04:00	47.6	66.6	39.7
21/04/2022 05:00	50.0	69.6	43.5
21/04/2022 06:00	50.9	66.9	47.1
21/04/2022 07:00	53.2	71.4	50.0

Start Time	End Time	Duration	L _{Aeq}	L _{A90}
20/04/2022 23:00	20/04/2022 23:15	00:14:59	48.1	43.4
20/04/2022 23:15	20/04/2022 23:30	00:15:00	47.1	43.6
20/04/2022 23:30	20/04/2022 23:45	00:15:00	46.9	42.7
20/04/2022 23:45	21/04/2022 00:00	00:15:00	46.2	41.2



Appendix B - Extraction Fan detail

Fan Code	45JM/16/4/5/30
Fan Diameter / Size	450 Size / mm
Blades	5
Fan Speed	1420 rpm
Velocity	7.6 m/s
Blade Angle	30°
Installation Type / Form of Running	D / B
Fan Casing	Long
Requested Duty	1.2m³/s @ 135 Pa (static)
Outlet Dynamic Pressure	35 Pa
Duty Shaft Power	0.322 kW
Max Shaft Power	0.331 kW
Total Efficiency	64.1 %
Pitch Angle Range	24° - 30°
Motor Frame	BT9 (Sized at 1.2kg/m³ Air Density)
Motor Grade	IE1
Motor Rating	0.320 kW
Full Load Current	2.2 A
Starting Current	5 A
Motor Mounting	Pad
Electrical Supply	220-240 Volts 50 Hz 1 Phase
Start Type	DOL
Motor Winding	Standard
Enclosure	Standard All
ErP [FMEG] Rating	N 51 (ErP Compliant 2013)
ErP [FMEG] Target	N 50
Measurement Category	D
Efficiency Category	Total
Fan + Motor Efficiency	43.0% (1.5 m³/s @ 132 Pa)
Motor Input Power (ErP)	0.463 kW
SFP value	0.41 W/(l/s)
Energy Consumption	999 kWh (2000 h/year)
Running Cost / Year	£90
Air Density	1.2 kg/m³ / 20 °C / 0 m / 50% RH
Smoke Venting	Non Smoke Venting
Product Number	EJ461466

	Sound Spectrum (Hz)								Overall	
	63	125	250	500	1k	2k	4k	8k	Lw*	LpA @ 3 m**
Inlet*	75	74	70	68	64	63	59	55	79	50
Outlet*	76	74	70	68	64	63	60	56	79	50
Breakout*	66	56	48	45	39	35	38	32	67	28

* Lw dB re 10⁻¹² W

** dBA re 2x10⁻⁵ Pa

Performance data has been derived from tests carried out in a Flakt Woods laboratory, in accordance with ISO 5801 and is specifically applicable for Ducted



BDER-40

SOUND ATTENUATION

BDER-40 size - length		Attenuation (dB) at octave bands, middle frequency (Hz)							
		63	125	250	500	1000	2000	4000	8000
008	-030	6	4	9	14	18	22	17	15
	-060	8	7	14	21	27	36	29	22
010	-030	3	5	9	10	14	20	15	13
	-060	12	9	13	18	25	37	27	21
	-090	14	12	18	24	32	43	34	26
	-120	15	14	23	30	39	45	40	30
012	-030	4	5	7	9	13	19	11	12
	-060	3	8	11	16	21	29	18	17
	-090	7	10	15	23	30	39	25	23
	-120	7	11	20	29	37	45	32	27
016	-030	1	2	4	8	12	17	10	11
	-060	3	5	8	13	19	25	16	16
	-090	6	7	11	19	26	32	20	20
	-120	8	8	15	24	32	38	25	22
020	-060	2	4	7	13	16	21	14	16
	-090	7	6	10	18	24	27	17	19
	-120	8	7	13	21	29	32	21	22
025	-060	7	3	5	10	14	17	13	15
	-090	7	4	7	15	21	23	16	19
	-120	7	5	9	20	27	26	19	22
031	-060	1	2	4	9	15	13	10	13
	-090	3	3	6	13	20	18	14	16
	-120	3	4	8	15	24	21	16	17
040	-090	3	3	5	14	18	15	15	15
	-120	3	3	6	18	22	18	17	17
050	-090	4	2	3	13	14	10	13	11
	-120	4	3	5	17	17	12	14	13
Tolerance ±		6	3	2	2	2	2	2	3



Appendix C – Extraction Calculation

Inlet	63	125	250	500	1000	2000	4000	8000	Lw	Lp@17m
45JM/16/4/5/30	75	74	70	68	64	63	59	55	79	46.4
silencer - BDER-40-040-12	3	3	6	18	22	18	17	17		
a-weighting	-26.2	-16.1	-8.6	-3.2	0	1.2	1	-1.1		
resulting sound level	45.8	54.9	55.4	46.8	42	46.2	43	36.9	59.2	26.6



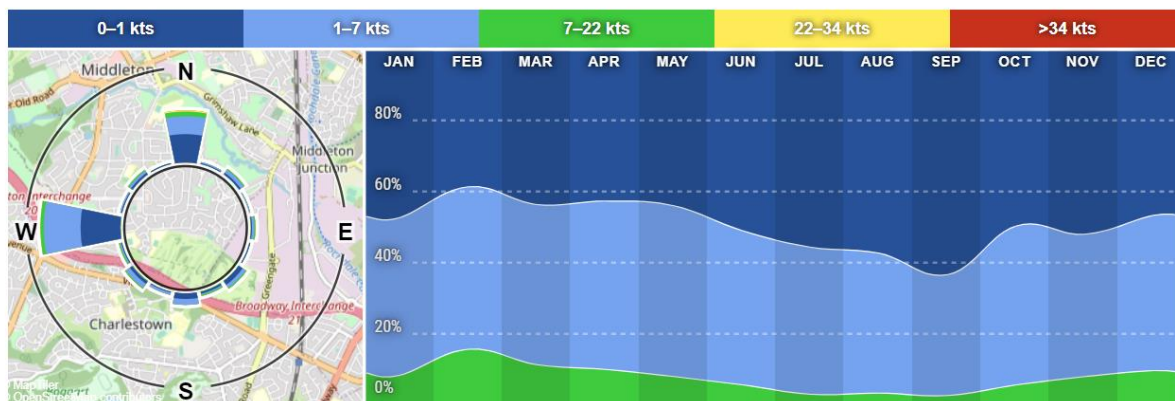
Appendix D– Weather Data



Dominant wind direction

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
➤	➤	➤	➤	➤	➤	➤	➤	➤	➤	➤	➤
W	WNW	WNW	NW	WNW	WNW	W	W	NW	WNW	NW	W

Monthly wind direction and strength distribution





Appendix E – Odour Assessment

Impact Risk	Odour Control Requirement	Significance Score*
Low to Medium	Low level odour control	Less than 20
High	High level odour control	20 to 35
Very high	Very high level odour control	more than 35

Criteria	Score	Score	Details
Dispersion	Moderate	5	Discharging 1m above the ridge
Proximity to Receptors	Medium	10	Closest sensitive receptor 17m from kitchen discharge
Size of Kitchen	Small	1	
Cooking type	V.High	10	Fast food
Total		26	