

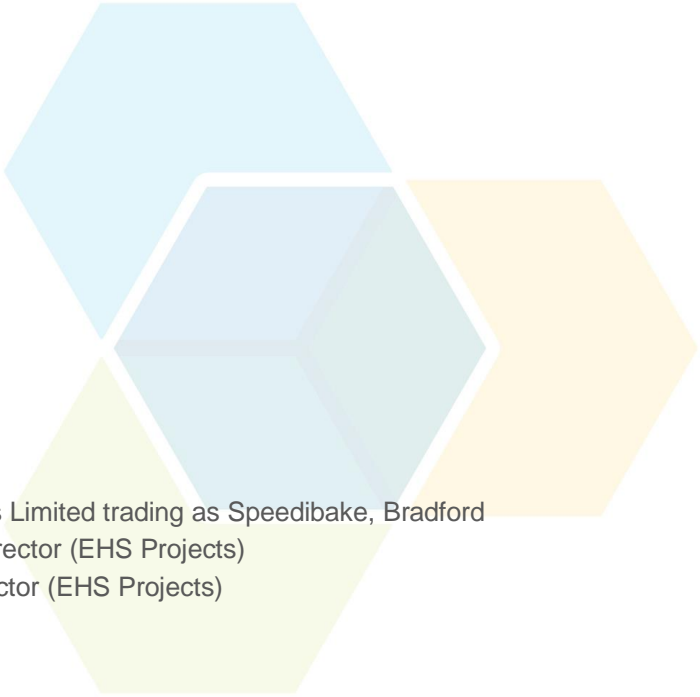


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## Speedibake H1 Air Quality Assessment Report

A decorative graphic consisting of four overlapping hexagons in shades of light blue, light green, and light yellow, positioned in the lower right quadrant of the page.

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Date of issue: 21/08/2024



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## 1 Introduction

In support of the Speedibake, Bradford, BD4 OSG installation (hereafter 'site') environmental permit variation (V006) application to cover the inclusion of a new pizza base manufacturing line on site, EHS Projects (hereafter 'EHS') were commissioned to undertake a H1 screening assessment of the combustion gas emissions from the site.

This report includes holistic assessment of the facility covering existing boiler and burner air emissions points, as well as the new pizza line burner air emission points. A second assessment addresses the impact of the new line in isolation.

A copy of the H1 tools for each assessment are provided in:

- Appendix 6a(i) – Whole Site H1 Tool,
- Appendix 6a(ii) – Pizza Base Burners H1 Tool.

## 2 Emissions Input Data

There are several combustion related point source air emissions points across the site, these are a combination of baking oven burners and also boiler stacks. There is very little measured air emissions data from the site. None of the burners are obligated to be monitored through environmental permitting. The boilers on site are MCP, however, were installed before 2018 and are therefore considered 'existing'. Hence, there is no recent exhaust emissions monitoring. The assessments therefore rely on historical monitoring results previously used for the determination of the original environmental permit, manufacturer data, and estimates based on proxy data.

The stack heights of all emissions are understood to be less than three metres higher than the relevant building height. An effective height of zero is therefore used in all cases.

The emissions input data is summarised in the tables overleaf:

**Table 1: H1 Input Data:**

Environmental Assessment									
Add release point	Delete selected row	Clear the information of selected row							
Release point code	Location or grid reference	Activity/Activities	Effective height (metres)	Dispersion factor (Long term)	Dispersion factor (short term)	Dispersion factor (monthly)	Efflux velocity (m/s)	Total flow (m3/h)	
A1	Steam Boiler 1	Natural Gas steam boiler	0	148	3900	529	4.01	2095	
A2	Steam Boiler 2	Natural Gas steam boiler	0	148	3900	529	3.88	2026	
A10	Gouet oven extract 1	Cooking burner exhaust	0	148	3900	529	5.31	1094	
A11	Gouet oven extract 2	Cooking burner exhaust	0	148	3900	529	5.31	1094	
A16	Mecatherm C oven burner extract	Cooking burner exhaust	0	148	3900	529	5.31	1094	
A38	Thermal oil plant flue	Thermal oil plant flue	0	148	3900	529	4.01	2095	
A60	Muffin 2 gas fired oil heater exhaust	Cooking burner exhaust	0	148	3900	529	2.78	1077	
A63	Pizza oven entrance stack	Cooking burner exhaust	0	148	3900	529	2.78	1077	
A68	Pizza oven exist stack	Cooking burner exhaust	0	148	3900	529	2.78	1077	
A19	Mecatherm D oven burner exhaust	Cooking burner exhaust	0	148	3900	529	5.31	1094	

Add Substance	Delete Selected Row								
Release Point	Substance	Measurement method	Operating mode(%)	Long term conc (mg/m3)	Release rate g/s (long term)	Measurement basis (Long term)	Short term conc (mg/m3)	Release rate g/s (short term)	
A1	Nitrogen dioxide	Estimated	100%	8.6	0.01		8.6	0.01	
A2	Nitrogen dioxide	Estimated	100%	9.8	0.01		9.8	0.01	
A10	Nitrogen dioxide	Estimated	100%	36	0.01		36	0.01	
A11	Nitrogen dioxide	Estimated	100%	36	0.01		36	0.01	
A16	Nitrogen dioxide	Estimated	100%	36	0.01		36	0.01	
A19	Nitrogen dioxide	Estimated	100%	36	0.01		36	0.01	
A38	Nitrogen dioxide	Estimated	100%	8.6	0.01		8.6	0.01	
A60	Nitrogen dioxide	Estimated	100%	47	0.01		47	0.01	
A63	Nitrogen dioxide	Estimated	100%	30.1	0.01		30.1	0.01	
A68	Nitrogen dioxide	Estimated	100%	30.1	0.01		30.1	0.01	

**Table 2: Input Data Sources**

Permit Ref	Emissions point description	Data Sources
A1	Steam Boiler 1	Stack emissions monitoring results described in the Enviro Air Quality Impact Assessment (Appendix 6b).
A2	Steam Boiler 2	
A10	Gouet oven extract 1	Nearest equivalent is the Mecatherm burner, proxy data used.
A11	Gouet oven extract 2	
A16	Mecatherm C oven burner exhaust	Equivalent to the Mecatherm C Oven Extract measured in Enviro Air Quality Impact Assessment.
A19	Mecatherm D oven exhaust	
A38	Thermal oil plant flue	Similar sized natural gas boiler to A1 & A2, therefore, proxy data used.
A60	Muffin 2 gas fired oil heater exhaust	Equivalent to Muffin Oven Extract 1, results taken as average of three points monitored in Enviro Air Quality Impact Assessment.
A63	Pizza oven entrance stack	NO <sub>x</sub> emissions concentrations at full fire were provided by Kyle Mann (Weishaupt (UK) Service Manager) for an identical burner that has recently been fitted to a blow moulding machine. This is the best proxy data available according to the burner manufacturer. The flow rate and velocity are assumed equivalent to the Muffin Oven Burner. This is likely over conservative as the A63 and A64 burners are more modern than the existing oven burners on site.
A68	Pizza oven exit stack	

### 3 Whole Site - H1 Assessment

Test 1 of the H1 tool utilises this information to calculate the total release rate of pollutants (the process contribution PC) from the whole Site and determines the relative impact of the emissions on Environmental Assessment Levels (EALs). To screen out a PC for any substance, so that no further assessment is required, the PC must meet both of the following criteria:

- the short-term PC is less than 10% of the short-term environmental standard.
- the long-term PC is less than 1% of the long-term environmental standard.

This test showed that for NO<sub>x</sub> the short-term PC is more than 10% of the short-term environmental standard and the PC was greater than 1% of the long-term environmental standard, a further test is required. See Test 1 result:

Test 1	Number	Substance	Long term EAL (ug/m <sup>3</sup> )	Long term PC (ug/m <sup>3</sup> )	%PC of EAL (long term)	>1% of EAL? (long term)	Short term EAL (ug/m <sup>3</sup> )	Short term PC (ug/m <sup>3</sup> )	%PC of EAL (short term)	>10% of EAL? (short term)
	1	Nitrogen dioxide	40	13.52058933	33.80%	fail	200	178.1429	89.07%	fail

Test 2 utilises the publicly available background NO<sub>x</sub> concentration to determine the Predicted Environmental Concentration (PEC) of the emissions. Test two screens' emissions as insignificant if both of the following requirements are met:

- the short-term PC is less than 20% of the short-term environmental standards minus twice the long-term background concentration.
- the long-term PEC is less than 70% of the long-term environmental standards.

Test 2 calculated that while the long-term emissions can be screened as insignificant, short terms emissions are other the threshold listed above. The emissions cannot be determined as insignificant using the H1 methodology, due only to a short term exceedence. See the results of Test 2 below:

Test 2	Number	Substance	Long term EAL (ug/m <sup>3</sup> )	Long term PC (ug/m <sup>3</sup> )	Air Background conc (ug/m <sup>3</sup> )	%PC of background (long term)	PEC Long term (ug/m <sup>3</sup> )	%PEC of EAL% (Long term)	%PC of EAL% EAL>70%? (long term)	Short term EAL (ug/m <sup>3</sup> )	Short term PC (ug/m <sup>3</sup> )	%PC of the EAL-2*background	%PC or threshold >20%? (short term)
	1	Nitrogen dioxide	40	13.52058933	11.257	47%	24.78	61.94%	pass	200	178.1429	100.37%	fail

### 4 New Pizza Base Burners – H1 Assessment

Input to the H1 Assessment is provided below:

Release point code	Location or grid reference	Activity/Activities	Effective height (metres)	Dispersion factor (Long term)	Dispersion factor (short term)	Dispersion factor (monthly)	Efflux velocity (m/s)	Total flow (m <sup>3</sup> /h)
A63	Pizza oven entrance stack	Cooking burner exhaust	0	148	3900	529	2.78	1077
A68	Pizza oven exist stack	Cooking burner exhaust	0	148	3900	529	2.78	1077

Release Point	Substance	Measurement method	Operating mode(%)	Long term conc (mg/m <sup>3</sup> )	Release rate g/s (Long term)	Measurement basis (Long term)	Short term conc (mg/m <sup>3</sup> )	Release rate g/s (short term)
A63	Nitrogen dioxide	Estimated	100%	30.1	0.01		30.1	0.01
A68	Nitrogen dioxide	Estimated	100%	30.1	0.01		30.1	0.01

Test 1 of the H1 tool utilises this information to calculate the total release rate of pollutants (the process contribution PC) from the whole Site and determines the relative impact of the emissions on

Environmental Assessment Levels (EALs). To screen out a PC for any substance, so that no further assessment is required, the PC must meet both of the following criteria:

- the short-term PC is less than 10% of the short-term environmental standard.
- the long-term PC is less than 1% of the long-term environmental standard.

This test showed that for NO<sub>x</sub> the short-term PC is more than 10% of the short-term environmental standard and the PC was greater than 1% of the long-term environmental standard, a further test is required. See Test 1 result:

Test 1	Number	Substance	Long term EAL (ug/m3)	Long term PC (ug/m3)	%PC of EAL (long term)	>1% of EAL? (long term)	Short term EAL (ug/m3)	Short term PC (ug/m3)	%PC of EAL (short term)	>10% of EAL? (short term)
	1	Nitrogen dioxide	40	2.66455333	6.66%	fail	200	35.119175	17.56%	fail

Test 2 utilises the publicly available background NO<sub>x</sub> concentration to determine the Predicted Environmental Concentration (PEC) of the emissions. Test two screens' emissions as insignificant if both of the following requirements are met:

- the short-term PC is less than 20% of the short-term environmental standards minus twice the long-term background concentration.
- the long-term PEC is less than 70% of the long-term environmental standards.

Test 2 calculated that the above statements are true for NO<sub>x</sub>, and therefore, the emissions can be determined as insignificant using the H1 methodology. See the results of Test 2 below:

Test 2	Number	Substance	Long term EAL (ug/m3)	Long term PC (ug/m3)	Air Background conc (ug/m3)	%PC of headroom (long term)	PEC Long term (ug/m3)	%PEC of EAL? (long term)	%PC of EAL? (long term)	Short term EAL (ug/m3)	Short term PC (ug/m3)	%PC of the EAL - 2*background? (short term)	%PC of EAL? (short term)
	1	Nitrogen dioxide	40	2.66455333	11.257	9%	13.92	34.81%	pass	200	35.119175	19.79%	pass

## 5 Qualitative justification

When considering the whole site emissions, while relying on manufacturer provided and proxy emissions data, the emissions cannot be screened out using the H1 methodology. This screening does however show that the two new burners have an insignificant impact on air quality.

It should be noted that the H1 tool provides a gross overestimation of the emissions impact; a key overestimation is the assumption in the tool that all points are emitting at all times. This is out of step with the operational reality of the site. Furthermore, the site does not reside within, or close to, a local authority Air Quality Management Area (AQMA) for any combustion related emissions.

Previously, the site commissioned a more accurate assessment of air emissions impact through detailed modelling undertaken by Enviro Consulting (Appendix 6b). This assessment concluded that the site comprises only 9.7% of the Environmental Assessment Level (EAL). It is highly unlikely that the marginal increase in emissions associated with the two new burners would change the conclusions of the detailed modelling.