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Air Quality Screening Assessment: Tean

Leys Farm, Leigh

Client: Roger Parry & Partners

Reference: APS_P1251A_A1-1

Date Published: 13 November 2024

Rev.	Date	Description	Prepared	Reviewed	Authorised
01	13/11/2024	Issued	ET	PO	KL

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1. Introduction

- 1.1. Air Pollution Services ([APS](#)), part of Kalaco Group Ltd, has been commissioned by Roger Parry & Partners ('the Client') to conduct an Air Quality Screening Assessment for a proposed biomass boiler installation at Tean Leys Farm, Tean Leys, Leigh, Stoke-on-Trent, Staffordshire, ST10 4NS ('the Proposed Development'), within the administrative area of Staffordshire Moorlands District Council ([SMDC](#)), on behalf of Mr Richard Brittlebank ('the Applicant'), in support of planning application SMD/2024/0299.
- 1.2. Following discussions between the Client and the SMDC Environmental Health Officer, a screening assessment was requested as part of the planning application process.
- 1.3. The assessment has been carried out by APS. It is important air quality assessments are conducted by suitably qualified experts with professional accreditations, such as being a member of the Institute of Air Quality Management ([IAQM](#)). Details of the assessment authors are set out in Section 8.
- 1.4. The Simple Calculation of Atmospheric Impact Limits ([SCAIL](#)) combustion tool was used to carry out the screening assessment in accordance with good practice. Consideration was given to the following:
 - Local Air Quality Management ([LAQM](#)) Technical Guidance (TG22);
 - Association for Environmental Assessment ([AEA](#)) Technical Guidance: Screening Assessment for Biomass Boilers; and
 - Environmental Protection UK ([EPUK](#)) Biomass and Air Quality Guidance for Local Authorities.
- 1.5. The screening assessment involved several data inputs to parameterise the combustion process, based on information provided by the Client.

2. The Proposed Development

- 2.1. The Proposed Development involves the installation of a single biomass boiler, an ETA Hack 500, at Tean Leys Farm. The boiler will be installed and maintained according to the manufacturer's specifications. Wood chips will serve as the fuel source.

Location

- 2.2. The Proposed Development is situated in a rural area in Leigh, Stoke-on-Trent, Staffordshire. The area around the Proposed Development mainly consists of open fields and farmland. The location of the Proposed Development is shown in Figure 1.
- 2.3. The closest air quality management area ([AQMA](#)) is the Stoke-on-Trent AQMA, declared by Stoke-on-Trent City Council ([SoTCC](#)), which is located approximately 7 km northwest of the Proposed Development. Existing pollutant levels in the vicinity are thus likely to be reasonable.
- 2.4. Scattered residential properties are nearby, along with eight designated sensitive ecological sites within a 10 km radius, as depicted in Figure 2.



Figure 1: Site Location





2.5. The assessment has been carried out using approaches set out in the following guidance.

- EPUK and IAQM Guidance on Land-Use Planning & Development Control: Planning For Air Quality, which considers the impacts and location of human exposure (EPUK/IAQM, 2017);
- Environment Agency ([EA](#)) Guidance: Air Emissions Risk Assessment for your Environmental Permit (Environment Agency, 2024);
- IAQM’s guide to the assessment of air quality impacts on designated nature conservation sites (IAQM, 2020); and
- The Environment Agency’s Air Quality Technical Advisory Group ([AQTAG](#)) document AQTAG21 – ‘Likely significant effect’ - use of 1% and 4% long-term thresholds and 10% short-term threshold (Air Quality Technical Advisory Group , 2015).

Combustion Parameters

2.6. For modelling purposes, the biomass boiler is assumed to be an ETA Hack 500. Emission information was provided in the Emissions Certificate and is outlined in Table 1.



Table 1: Pollutant Emission Rates

Pollutant	Biomass Boiler (New)
PM (g/GJ)	7
NOx (g/GJ)	64
Table note: Information provided by the Client from the Emissions Certificate which is set out in Section 11.	

- 2.7. Combustion parameters have been estimated based on the fuel consumption. The relevant parameters include the calculated actual (A) exhaust flow rate for the boiler and are set out in Table 2. These are based on 100% load and a complete combustion with 0% excess air (which is a conservative assumption related to plume buoyancy). The exhaust temperature is unknown but estimated to be 135 degrees Celsius.

Table 2: Plant Release Conditions

Parameter	Biomass Boiler (New)
Combustion Input	
Heat output (kW)	499
Efficiency	95%
Net Input Fuel Rate (kW _{in})	525
Gross Input Fuel Rate (kW _{in})	534
Gross Fuel Consumption (kg/hr) ^a	56.4
Combustion Air _{in} (kg/h)	944.26
Assumed Excess Air (%)	0.0%
Combustion Products	
Exhaust Temperature (°C)	135
Exhaust Flow (kg/h) for Actual Flow	999.6
Molar Flow Rate (mol/s) for Actual Flow	10.02
Molecular Mass (g/mol) for Actual Flow	27.71
Exhaust Flow (Am ³ /s) ^b for Actual Flow	0.336 ^c
Table notes: a. Parameters have been based on the combustion of wood with a 30% moisture content as a conservative approach. This has been used to calculate the flow rates. b. Calculated from molar flow rate x 8.3145 x (T+273.13) / 101,325. c. Actual flow conditions assumed to be 135 °C, 0.0% O ₂ , wet (19.4% H ₂ O).	

- 2.8. The relevant combustion and release parameters are given in Table 3.

Table 3: Boiler Parameters and Emission Rates

Parameter	Biomass Boiler (New)
Stack location ^a	401090 , 338148
Stack Height (m)	7.9
Diameter (m)	0.3
Temperature (°C)	135
Velocity (m/s)	4.75
Assumed operation	Continuous (8,760 hrs/ annum)
NO _x emission rate ^b	0.034 g/s



PM emission rate ^b	0.004 g/s
Table notes: a. The stack location is from GIS. b. Calculated from the kW (i.e. kJ/s) in Table 2 and the emissions in Table 1.	

3. Biomass Calculator

3.1. LAQM.TG22 states:

“Local authorities should screen individual biomass combustion installations by using the Biomass Calculator available for download on the LAQM Support website.

This Excel tool has been developed to help local authorities determine the maximum emission rate (in grammes per second) from a combustion installation for which a risk of exceedance of the relevant air quality objective is unlikely. Therefore, the methodology consists of comparing, for each biomass installation identified (using Table 7-4), the actual maximum emission rate for pollutants against the Target Emission Rate calculated by the tool.

If the actual emission rate is greater than the Target Emission Rate, then the local authority should proceed to a further assessment, based on detailed dispersion modelling.”

3.2. Screenshots of the inputs used in the tool and calculated emissions are shown in Figure 3 to Figure 7.

3.3. The emissions in g/s set out in Table 2 have been compared to those in the Biomass Calculator (Figure 3 to Figure 6). For NO_x, the emission rate for the proposed biomass boiler is 0.034 g/s, which is lower than the target emission rate for the annual mean of 0.1769 g/s (Figure 4) and the 1-hour mean of 0.0927 g/s (Figure 5). For PM, the emission rate for the proposed biomass boiler is 0.004 g/s, also below the target emission rates for the annual and 24-hour mean PM₁₀ of 0.0382 g/s (Figure 3) and the PM_{2.5} annual mean of 0.0969 g/s (Figure 6). Thus, it is unlikely that significant impacts will occur.

Figure 3: Biomass Emissions Screening Tool Results – ‘PM₁₀ Indiv Annual and 24-hour’

PM ₁₀ Emissions from Biomass Combustion Stacks (Individual Installations)	Additional Comments/Information																					
The target emissions of PM₁₀ in g/s from biomass combustion source emissions are calculated for your given stack details. Greater emission rates may result in exceedance of the 24-hour objective for PM₁₀ in England, Wales and Northern Ireland or the annual mean objective in Scotland. Enter required information in Yellow Cells Resulting Emission in Red Bold <table><tr><td>Building height</td><td>5.18</td><td>m</td></tr><tr><td>Stack diameter</td><td>0.3</td><td>m</td></tr><tr><td>Stack height</td><td>7.9</td><td>m</td></tr><tr><td>Location</td><td>Rest of UK</td><td></td></tr><tr><td>PM₁₀ Annual mean background concentration (include roadside contribution at relevant receptors)</td><td>10.4</td><td>µg/m³</td></tr><tr><td>Calculated Effective stack height</td><td>4.5</td><td>m</td></tr><tr><td>Target Emission Rate</td><td>0.0382</td><td>g/s</td></tr></table> If the maximum stack emission rate is less than the target above then it is not likely that the most stringent objective for PM₁₀ will be exceeded. If your emissions are greater then please refer to LAQM.TG(16) for further advice.	Building height	5.18	m	Stack diameter	0.3	m	Stack height	7.9	m	Location	Rest of UK		PM ₁₀ Annual mean background concentration (include roadside contribution at relevant receptors)	10.4	µg/m ³	Calculated Effective stack height	4.5	m	Target Emission Rate	0.0382	g/s	
Building height	5.18	m																				
Stack diameter	0.3	m																				
Stack height	7.9	m																				
Location	Rest of UK																					
PM ₁₀ Annual mean background concentration (include roadside contribution at relevant receptors)	10.4	µg/m ³																				
Calculated Effective stack height	4.5	m																				
Target Emission Rate	0.0382	g/s																				

Figure notes: Ambient background concentrations of PM₁₀ have been defined using the national pollution maps published by Defra (2023).



Figure 4: Biomass Emissions Screening Tool Results – ‘NO₂ Indiv Annual’

NO _x Emissions from Biomass Combustion Stacks (Individual Installations) - Annual Mean NO ₂ Objective	Additional Comments/Information
The target emissions of NO_x in g/s from biomass combustion source emissions are calculated for your given stack details. Greater emission rates may result in exceedance of the annual mean objective for NO₂.	
Enter required information in Yellow Cells Resulting Emission in Red Bold	
Building height	5.18 m
Stack diameter	0.3 m
Stack height	7.9 m
Location	Rest of UK
NO ₂ Annual mean background concentration (include roadside contribution at relevant receptors)	6.4 µg/m ³
Calculated Effective stack height	4.5 m
Target Emission Rate	0.1769 g/s
If the maximum stack emission rate is less than the target above then it is not likely that the annual mean objective for NO₂ will be exceeded. If your emissions are greater then please refer to LAQM.TG(16) for further advice.	

Figure notes: Ambient background concentrations of NO₂ have been defined using the national pollution maps published by Defra (2023).

Figure 5: Biomass Emissions Screening Tool Results – ‘NO₂ Indiv 1-hour’

NO _x Emissions from Biomass Combustion Stacks (Individual Installations) - 1-Hour Mean NO ₂ Objective	Additional Comments/Information
The target emissions of NO_x in g/s from biomass combustion source emissions are calculated for your given stack details. Greater emission rates may result in exceedance of the 1-hour mean objective for NO₂.	
Enter required information in Yellow Cells Resulting Emission in Red Bold	
Building height	5.18 m
Stack diameter	0.3 m
Stack height	7.9 m
Location	Rest of UK
NO ₂ Annual mean background concentration (include roadside contribution at relevant receptors)	6.4 µg/m ³
Calculated Effective stack height	4.5 m
Target Emission Rate	0.0927 g/s
If the maximum stack emission rate is less than the target above then it is not likely that the 1-hour mean objective for NO₂ will be exceeded. If your emissions are greater then please refer to LAQM.TG(16) for further advice.	

Figure notes: Ambient background concentrations of NO₂ have been defined using the national pollution maps published by Defra (2023).



Figure 6: Biomass Emissions Screening Tool Results – 'PM_{2.5} Indiv Annual'

PM _{2.5} Emissions from Biomass Combustion Stacks (Individual Installations) - Annual Mean	Additional Comments/Information																					
The target emissions of PM_{2.5} in g/s from biomass combustion source emissions are calculated for your given stack details. Greater emission rates may result in exceedance of the annual mean cap for PM_{2.5} in England, Wales and Northern Ireland or the annual mean objective in Scotland. The cap is 25 µg/m³ in England, Wales and Northern Ireland, whilst an objective of 10 µg/m³ applies in Scotland. Enter required information in Yellow Cells Resulting Emission in Red Bold <table><tr><td>Building height</td><td>5.18</td><td>m</td></tr><tr><td>Stack diameter</td><td>0.3</td><td>m</td></tr><tr><td>Stack height</td><td>7.9</td><td>m</td></tr><tr><td>Location</td><td>Rest of UK</td><td></td></tr><tr><td>PM_{2.5} Annual mean background concentration (include roadside contribution at relevant receptors)</td><td>6.6</td><td>µg/m³</td></tr><tr><td>Calculated Effective stack height</td><td>4.5</td><td>m</td></tr><tr><td>Target Emission Rate</td><td>0.0969</td><td>g/s</td></tr></table> If the maximum stack emission rate is less than the target above then it is not likely that either the cap or objective for PM_{2.5} will be exceeded. If your emissions are greater then please refer to LAQM.TG(16) for further advice.	Building height	5.18	m	Stack diameter	0.3	m	Stack height	7.9	m	Location	Rest of UK		PM _{2.5} Annual mean background concentration (include roadside contribution at relevant receptors)	6.6	µg/m ³	Calculated Effective stack height	4.5	m	Target Emission Rate	0.0969	g/s	
Building height	5.18	m																				
Stack diameter	0.3	m																				
Stack height	7.9	m																				
Location	Rest of UK																					
PM _{2.5} Annual mean background concentration (include roadside contribution at relevant receptors)	6.6	µg/m ³																				
Calculated Effective stack height	4.5	m																				
Target Emission Rate	0.0969	g/s																				

Figure notes: Ambient background concentrations of PM_{2.5} have been defined using the national pollution maps published by Defra (2023).

Figure 7: Biomass Emissions Screening Tool Results – 'PM₁₀ Comb Annual and 24-hour'

PM ₁₀ Emissions from Biomass Combustion Stacks (Combined Installations)	Additional Comments/Information												
The annual emissions from a 500m × 500m square (the threshold emissions density) that may give rise to an exceedance of the annual mean objective (in Scotland) / 24-hour mean objective (Rest of UK) for PM₁₀ for a particular background concentration. Enter required information in Yellow Cells Resulting Emission in Red Bold <table><tr><td>Location</td><td>Rest of UK</td><td></td></tr><tr><td>Area Type</td><td>Village</td><td></td></tr><tr><td>PM₁₀ Annual mean background concentration (include roadside contribution at relevant receptors)</td><td>17</td><td></td></tr><tr><td>Threshold Emission Density</td><td>9550</td><td>kg/year</td></tr></table> If the emissions density is less than the Threshold Emissions Density, then it is not likely that the most stringent objective for PM₁₀ will be exceeded. If it exceeds the Threshold Emissions Density, then the authority should proceed to detailed dispersion modelling and/or monitoring - please refer to LAQM.TG(16) for further advice.	Location	Rest of UK		Area Type	Village		PM ₁₀ Annual mean background concentration (include roadside contribution at relevant receptors)	17		Threshold Emission Density	9550	kg/year	Note, for the purpose of this tool, the following is typically assumed for Area Type: - Village ~ 1km² - Small Town ~ 4km² - Large Town ~ 16km²
Location	Rest of UK												
Area Type	Village												
PM ₁₀ Annual mean background concentration (include roadside contribution at relevant receptors)	17												
Threshold Emission Density	9550	kg/year											

Figure notes:
Ambient background concentrations of PM₁₀ have been defined using the national pollution maps published by Defra (2023). The actual PM₁₀ background is lower but the minimum level which can be set in the tool is 17.

4. Parameterisation of SCAIL-Combustion

- 4.1. SCAIL for combustion sources is a screening tool that uses the atmospheric dispersion model AERMOD for assessing the impact on automatically identified designated habitats such as Sites of Special Scientific Interest (SSSIs) and Special Areas of Conservation (SACs). The tool can also output impacts at locations of human exposure based on manual selection.
- 4.2. The model provides an estimate of the pollutant concentrations at relevant locations with the acidity, nitrogen and sulphur deposited on a habitat from the combustion source.
- 4.3. The SCAIL-Combustion screening model uses data from a single nearby meteorological station. Detailed dispersion model assessments normally use 5 years of data from the nearest station. It is



theoretically possible to prepare 5-year datasets from each UK station where the relevant variables are recorded. However, this would result in long model-run times, which are not desirable for a screening model. A simulation period of one year reduces the screening model run-time but still provides mean annual output data. If one year of data is used then it should be a “typical” year for that location.

- 4.4. SCAIL-Combustion will calculate the process contribution (PC) and the predicted environmental concentration (PEC) as a percentage of the relevant standard.

SCAIL Guidance and Inputs

- 4.5. A summary of the inputs and assumptions made in relation to the SCAIL tool has been set out in Table 4. The SCAIL tool automatically selects the closest meteorological station.

Table 4: SCAIL Considerations and Inputs

Parameter	Value
Run mode	Hybrid Mode.
Buildings	The stack height is less than 2.5 times that of nearby buildings. The closest human health receptor is located over 60 m from the stack, and there are no SACs or SSSIs within 500 m of the proposed development. Therefore, it was deemed unnecessary to use an effective release height in place of the actual stack height.
Screening distance and search radius	10 km
Meteorological site	Stoke-on-Trent (STOK) site has been used by SCAIL.
Table notes: -	

Significant Contribution Criteria

Ecological

- 4.6. Within this assessment, when screening the PC for SACs and SSSIs, where the long-term PCs are below 1% of the assessment level the impacts from the Proposed Development are considered to be not significant. Where impacts are above these levels, a quantitative assessment of the impacts of the emissions from the biomass boilers will be required using the ADMS-6 model.

Human Exposure

- 4.7. The approach set out in the EPUK and IAQM guidance provides a method for describing the impacts on local air quality arising from development.
- 4.8. In relation to the annual mean standards, impact descriptors for individual receptors are used. These descriptors express the magnitude of incremental change as a proportion of a relevant AQAL, and then examine this change in the context of the new total concentration and its relationship with the assessment criterion. Table 5 sets out the matrix for determining the impact descriptor for annual mean concentrations at individual receptors, based on Table 6.3 in the EPUK and IAQM guidance document (EPUK/IAQM, 2017).



Table 5: Annual Mean Impact Descriptors for Individual Receptors

Annual Mean Concentration with Proposed Development ($\mu\text{g}/\text{m}^3$)	% Change in Concentration relative to the AQO ($\mu\text{g}/\text{m}^3$)			
	1	2-5	6-10	>10
75% or less of AQO	Negligible	Negligible	Slight	Moderate
76-94% of AQO	Negligible	Slight	Moderate	Moderate
95-102% of AQO	Slight	Moderate	Moderate	Substantial
103-109% of AQO	Moderate	Moderate	Substantial	Substantial
110% or more of AQO	Moderate	Substantial	Substantial	Substantial

Table notes: n/a

- 4.9. The findings from the screening tool are discussed in the following section, with a focus on both ecological sites and human receptors.

5. Results – Ecological Sites

- 5.1. There are eight designated ecological sites within a 10 km radius of the Proposed Development. These are shown in Figure 2 and listed in Table 6, ordered from closest to furthest.
- 5.2. The impacts of the Proposed Development on ecological receptors, as estimated using SCAIL, are set out in Table 6.

PC Screening

- 5.3. Where the long-term PC is less than 1% of the AQAL for national network and nationally designated sites, impacts can be screened out as insignificant.
- 5.4. Table 6 shows that none of the eight ecological sites within a 10 km radius exceed the criteria for nitrogen oxides (NO_x), sulphur dioxide (SO_2) concentrations, or nitrogen and acid deposition. Detailed impacts are presented only for the nearest site, as impacts decrease with distance. The PC remains well below the critical levels and loads, indicating no significant risk to these ecological sites. Note, some more distance sites may be more sensitivity and therefore lower impacts may not screen out. This has been reviewed and all sites screen out. Further consideration of the PEC at any of the sites is therefore unnecessary.

Table 6: SCAIL Tool Results (1 Point Source, Hybrid Mode)

Parameter	NO_x Conc ($\mu\text{g}/\text{m}^3$)	SO_2 Conc ($\mu\text{g}/\text{m}^3$)	N Dep. (kg N/ha/yr)	Acid Dep. (keq H^+ /ha/yr)
1. Dimmings Dale & The Ranger (SSSI) – Distance: 6.1 km				
PC	0.01	0	0.0012	0
Background concentration at receptor edge	7.05	0.95	21.15	1.688 (N:1.510 S:0.158)
PEC	7.1	0.9	21.2	1.688
Critical Levels (CLE) / Critical Loads (CLO)	30	20	Invertebrate assemblage	No sensitive habitat or species at this site
PC as a percentage of the relevant standard	0.0%	0.0%	n/a	n/a
PEC as a percentage of the relevant standard	23.5%	4.8%	n/a	n/a



Table 6: SCAIL Tool Results (1 Point Source, Hybrid Mode)

Parameter	NO _x Conc (µg/m ³)	SO ₂ Conc (µg/m ³)	N Dep. (kg N/ha/yr)	Acid Dep. (keq H ⁺ /ha/yr)
Screening	Screens out	Screens out	Screens out	Screens out
2. Saltersford Lane Meadows (SSSI)– Distance: 7.9 km				
Screening	Screens out			
3. Whiston Eaves (SSSI) – Distance: 8.1 km				
Screening	Screens out			
4. Froghall Meadow and Pastures (SSSI) – Distance: 8.4 km				
Screening	Screens out			
5. Bath Pasture (SSSI) – Distance: 9.1 km				
Screening	Screens out			
6. Churnet Valley (SSSI) – Distance: 9.3 km				
Screening	Screens out			
7. West Midlands Mosses (SAC) – Distance: 9.4 km				
Screening	Screens out			
8. Chartley Moss (SSSI) – Distance: 9.4 km				
Screening	Screens out			
Table notes: 'Conc' means concentration. 'Dep' mean deposition.				



6. Results – Human Exposure

- 6.1. Regarding human exposure, the potential impacts of the Proposed Development on local residents have been assessed. Five receptors were chosen to represent nearby residential properties, as illustrated in Figure 8.

Figure 8: Human Exposure Receptors

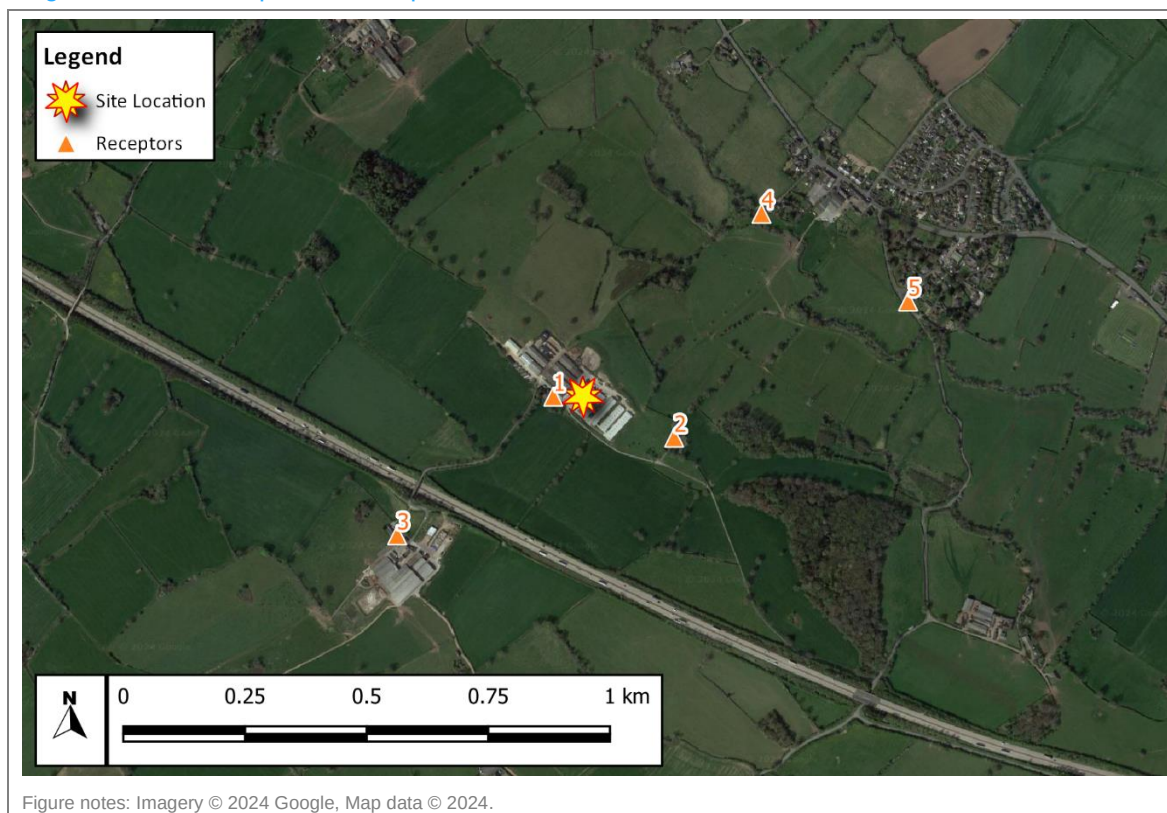


Figure notes: Imagery © 2024 Google, Map data © 2024.

- 6.2. The impacts of the Proposed Development on human receptors, as estimated using SCAIL, are set out in Table 7. The impacts at all human receptors are negligible and therefore there are no likely significant impacts.

Table 7: SCAIL Tool Results (Human Exposure Receptors)

Parameter	Annual Mean NO ₂ Conc (µg/m ³)	Annual Mean PM ₁₀ Conc (µg/m ³)
R1 – Distance: 61 m		
PC at receptor edge	0.27	0.0
Background concentration at receptor edge	6.62	11.20
PEC	6.9	11.25
Environmental Assessment Level	40	40
PC as a percentage of the relevant standard	0.7%	0%
PEC as a percentage of the relevant standard	17.2%	28%
Screening criteria	Air Quality Health Impact Descriptors*	Air Quality Health Impact Descriptors*
Screening	Negligible	Negligible



Table 7: SCAIL Tool Results (Human Exposure Receptors)

Parameter	Annual Mean NO ₂ Conc (µg/m ³)	Annual Mean PM ₁₀ Conc (µg/m ³)
R2 – Distance: 64 m		
PC	0.37	0.1
Background concentration at receptor edge	6.62	11.20
PEC	7.0	11.26
Environmental Assessment Level	40	40
PC as a percentage of the relevant standard	0.9%	0%
PEC as a percentage of the relevant standard	17.5%	28%
Screening criteria	Air Quality Health Impact Descriptors*	Air Quality Health Impact Descriptors*
Screening	Negligible	Negligible
R3 – Distance: 477 m		
PC	0.09	0.0
Background concentration at receptor edge	6.68	11.40
PEC	6.8	11.42
Environmental Assessment Level	40	40
PC as a percentage of the relevant standard	0.2%	0%
PEC as a percentage of the relevant standard	16.9%	29%
Screening criteria	Air Quality Health Impact Descriptors*	Air Quality Health Impact Descriptors*
Screening	Negligible	Negligible
R4 – Distance: 524 m		
PC	0.11	0.0
Background concentration at receptor edge	6.62	11.20
PEC	6.7	11.22
Environmental Assessment Level	40	40
PC as a percentage of the relevant standard	0.3%	0%
PEC as a percentage of the relevant standard	16.8%	28%
Screening criteria	Air Quality Health Impact Descriptors*	Air Quality Health Impact Descriptors*
Screening	Negligible	Negligible
R5 – Distance: 696 m		
PC	0.08	0.0
Background concentration at receptor edge	6.62	11.20



Table 7: SCAIL Tool Results (Human Exposure Receptors)

Parameter	Annual Mean NO ₂ Conc (µg/m ³)	Annual Mean PM ₁₀ Conc (µg/m ³)
PEC	6.7	11.22
Environmental Assessment Level	40	40
PC as a percentage of the relevant standard	0.2%	0%
PEC as a percentage of the relevant standard	16.7%	28%
Screening criteria	Air Quality Health Impact Descriptors*	Air Quality Health Impact Descriptors*
Screening	Negligible	Negligible
Table notes: * As explained in paragraph 4.8, in relation to the annual mean standards, impact descriptors for individual receptors are used which expresses the magnitude of incremental change as a proportion of a relevant AQAL and then examining this change in the context of the new total concentration and its relationship with the assessment criterion. Table 3 sets out the matrix for determining the impact descriptor for annual mean concentrations at individual receptors, based on Table 6.3 in the EPUK and IAQM guidance document (EPUK/IAQM, 2017).		

7. Summary and Conclusions of the Impact Assessments

- 7.1. The emissions from the biomass boilers are lower than those set out in the Biomass Calculator tool, implying there is a low risk of adverse impacts from the proposed boiler. To provide a more informed assessment, the SCAIL-Combustion tool has also been used.
- 7.2. The SCAIL-Combustion tool, in 'Hybrid' mode, indicates that:
 - There are unlikely to be any significant effects on ecological sites within a 10 km radius from the Proposed Development, with none of the ecological sites experiencing exceedances of the relevant criteria; and
 - The human health impacts are described as *negligible* at all receptor locations.
- 7.3. Overall, taking into account the findings from the SCAIL-Combustion tool and using professional judgement, it is not considered that the operation of the biomass boiler will have a significant impact on air quality.
- 7.4. Should there be concerns, to further evaluate the magnitude of impact, a detailed quantitative assessment of the impacts of the emissions from the biomass boiler using the ADMS-6 model may be completed.

8. Profession Experience

Kieran Laxen, MEng (Hons) MEnvSc MIAQM

Kieran is a director and founder of APS and has 16 years' experience in the field of air quality. He has worked on hundreds of projects, including port schemes, road schemes, residential and commercial developments, industrial processes, energy from waste sites, infrastructure projects. Kieran is an active member of the IAQM committee (and a current Vice Chair), has led a number of air quality position statements and has been involved in developing IAQMs guidance. He has extensive experience of ambient air quality monitoring and dispersion modelling at sub-regional scales for planning and permit applications. He developed Kalaco's meteorological data services, processing Met Office data and creating numerical weather prediction (NWP) data in a range of



formats to suit different dispersion models. He has developed Kalaco's in-house EMEP regional chemical transport model capability running regional models for Europe. He has completed a number of research projects for the regulators. He provided technical advice and co-ordinated stakeholder engagement for the selection and implementation of the dispersion model in JNCC's UK Air Pollution Assessment Service (UK APAS) and has conducted a review of observational and NWP data for use in modelling for the project with a clear understand of regulatory requirements. He has substantial experience in assessing air quality, dust, and odour for planning applications, for a diverse range of developments, and supporting local authorities with their LAQM duties, such as AQMA and AQAP development.

Ellie Tsiarapa, MSc AMIEnvSc AMIAQM

Ellie is a Consultant at APS with several years' experience. She previously undertook pollution and bioaerosol research at the Air Quality Management Resource Centre (AQMRC). She has been involved in several EU and UK research projects, and also has experience in dispersion modelling. She holds an MSc in Environmental Consultancy from the University of the West of England (UWE) and has experience in preparing air quality and odour assessments for planning and permitting applications as well as support for local authorities. This has included residential, commercial, and retail developments as well as power generation, waste, and mineral facilities.

Liana Malynczakova, MSc BA (Hons) AMIEnvSc AMIAQM

Liana is an Assistant Consultant, having previously completed a MSc Sustainability degree at University of Southampton where she was involved in a European research project on shipping emissions, drawing on her previous six months' research internship at the AQMRC at the UWE where she also completed BA Geography degree. She is currently gaining experience in undertaking air quality, odour, dust, climate change and indoor air quality assessments for a wide range of developments for planning and permit applications and support for local authorities.

9. Glossary

AEA	Association for Environmental Assessment
APS	Air Pollution Services
AQMA	Air Quality Management Area
AQTAG	Air Quality Technical Advisory Guidance
CL_e	Critical level for the protection of vegetation
CL_o	Critical load for the protection of a habitat
EA	Environment Agency
EPUK	Environmental Protection UK
kgN/ha/yr	Microgramme of nitrogen per hectare per year. A measure of the rate of nitrogen deposition to the ground
kEqH/ha/yr	Kilogram equivalent of hydrogen per hectare per year. A measure of the rate of acid deposition to the ground.
IAQM	Institute of Air Quality Management



LAQM	Local Air Quality Management
N	Nitrogen
NO₂	Nitrogen dioxide
NO_x	Nitrogen oxides
PC	Process Contribution
PEC	Predicted Environmental Concentration
PM₁₀	Small airborne particles, more specifically particulate matter less than 10 micrometres in aerodynamic diameter
PM_{2.5}	Small airborne particles, more specifically particulate matter less than 2.5 micrometres in aerodynamic diameter
SAC	Special Areas of Conservation
SCAIL	Simple Calculation of Atmospheric Impact Limits
SMDC	Staffordshire Moorlands District Council
SO₂	Sulphur dioxide
SoTCC	Stoke-on-Trent City Council
SSSI	Sites of Specific Scientific Interest
µg/m³	Microgramme per cubic metre of air; a measures of concentration of an air pollutant

10. References

[Air Quality Technical Advisory Group . \(2015\). AQTAG21: Likely significant effect -use of 1% and 4% long-term thresholds and 10% short -term threshold, Updated version.](#)

[Environment Agency. \(2024, May 21\). \[www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit\]\(https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit\)\). Retrieved from GOV.UK.](#)

[EPUK/IAQM. \(2017\). Land-Use Planning & Development Control: Planning For Air Quality.](#)

IAQM. (2020). *A guide to the assessment of air quality impacts on designated nature conservation sites.*

11. Emissions

- 11.1. The following screenshot is the last page of the Emissions Certificate provided by the Client. The certificate was issued by the TÜV SÜD Industrie Service GmbH testing laboratory.



Non-Domestic Renewable Heat Incentive

e) Measured* emissions of PM in g/GJ net heat input <i>*This average value should be from the test confirmed in 4c Results from partial load tests are not required. This value must be in the specified units.</i>	Hackgut 499	7
	Pellet 499	10
f) Measured* emissions of NOx in g/GJ net heat input <i>*This average value should be from the test confirmed confirmed in 4c. Results from partial load tests are not required. This value must be in the specified units.</i>	Hackgut 499	64
	Pellet 499	44

Note A: If details from a previously issued certificate or an original test report are being transferred to this RHI emission certificate template, please note that this document must be **issued by the testing laboratory** as a separate certificate. The issue date and certificate reference number should be in relation to *this* certificate produced using the RHI template, not the issue date and reference number of the original certificate or test report.

Note B: If you are including multiple tested plants on one certificate, please ensure that all sections are completed for each tested plant, and are laid out such that it is clear which details relate to which tested plant. If a type-testing range is included as well, please show clearly which type-testing range relates to which tested plant(s), following the type-testing range ratio rules outlined in 2g.