H1 Assessment to support a Bespoke Installation Permit Application: Parkham Farms Cheese Factory

On behalf of:

Parkham Farms Cheese Factory, Higher Alminstone Farm, Woolsery, Bideford, Devon EX39 5PX

ETL928/2026

Prepared by:

Earthcare Technical Ltd
Manor Farm
Chalton
Waterlooville
Hants PO8 0BG

Tel: 02392 290 488

Email: Office@earthcaretechnical.co.uk

27 February 2026

QUALITY CONTROL

Document Title:	**H1 Assessment to support a Bespoke Installation Permit Application: Parkham Farms Cheese Factory**
Document Reference:	ETL928_H1_V1.0_PFL_Feb2026
Prepared For:	Parkham Farms Ltd
Project Reference:	ETL928/2026
Copyright:	Earthcare Technical Ltd. © 2026

Version Control

Issue	Date	Revision details	Author	Review	Approved by
Version 1 Issue 0	27 Feb 2026	First Issue	M Fuhrmann	Dr C McHugh	A Becvar

Contents

LIST OF TABLES

Abbreviations

AAD	Ambient Air Directive
AQMA	Air Quality Management Area
AQIA	Air Quality Impact Assessment
AQS	Air Quality Standards
CIP	Clean in Place
CN	Common nomenclature
CO	Carbon monoxide
DCC	Devon County Council
EA	Environment Agency
EAL	Environmental Assessment Level
ELV	Emission Limit Value
ETL	Earthcare Technical Ltd
H1	H1 Assessment
kWe	Kilowatts electrical output
kWthi	Kilowatts thermal input
MCPD	Medium Combustion Plant Directive
MWthi	Megawatts thermal input
NGR	National Grid Reference
NOx	Nitrogen oxides
NO_2	Nitrogen dioxide
O_2	Oxygen
PC	Process Contribution
PEC	Predicted environmental concentration
PFL	Parkham Farms Ltd
SAC	Special Area of Conservation
SO_2	Sulphur dioxide
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
TDC	Torridge District Council

1 Introduction

1.1 Background

This H1 Assessment (H1) has been prepared by Earthcare Technical Ltd (ETL) on behalf of Parkham Farms Limited (PFL) in support of an application for a bespoke installation permit (Permit ref: EPR/HP3728LG) for Parkham Farms Cheese Factory, Higher Alminstone Farm, Woolsery, Bideford, EX39 5PX (the Site) operated by Parkham Farms Limited (PFL), herein termed 'the Operator'.

An H1 risk assessment using the H1 tool, which is a conservative tool, is used to screen out the pollutants from the proposed emission sources that do not require further assessment. Pollutants that do not screen out need to be considered in an Air Quality Impact Assessment (AQIA) which would use detailed dispersion modelling.

Parkham Farms manufacture Cheddar cheese from milk produced by Parkham Farm's own herds and directly contracted local farms. On-site processes include:

- Food and drink production processes utilising milk (the dairy) to produce cheddar cheese;
- Production of by-products including cream, lactose and WPC via Ultrafiltration (UF) and Reverse Osmosis (RO); and
- Further treatment of permeate water by chlorine dioxide dosing to produce process water for site use.

Raw milk is stored in a series of milk silos. Milk is transferred from storage silos into the Cheese Processing Building, where it undergoes pasteurisation via a continuous pasteuriser. Cleaning-in-Place (CIP) systems are used throughout the process to maintain hygiene and product integrity, supported by hot and cold-water storage and recovery systems. The Pasteuriser and CIP systems use heat from 2 No. 1.84 MWthi steam Boilers on site (one duty and one standby).

Emissions to air from the operation are summarised in Table 1, which includes emissions to air from an emergency back-up diesel generator also available for on-site use. The location of the emission points can be seen in Figure 1 – Permit Boundary and Emission Points Plan.

Table 1: Boilers for steam production

Emission point	Size (MWthi)	Commissioning date	Grid reference (X, Y)	Fuel
A1 - Boiler 1	1.84 *	2005	235238, 120766	Kerosene [(a)]
A2 - Boiler 2	1.84 *	2005	235237, 120762	Kerosene [(a)]
A3 – Standby generator	1.95 **	2017	235227, 120770	Diesel
Notes: * Based on 1,567 kW at 85% efficiency. ** Based on 805 kVA at 33% efficiency. (a) Not exceeding 0.1% w/w sulphur content.				

The European Union Medium Combustion Plant (MCP) Directive (MCPD) controls apply to all in-scope MCP with a rated thermal input of each unit between 1 MWthi and 50 MWthi regardless of the type of fuel used. The boilers have a rated thermal input in the 1 MWthi – 5 MWthi range and are in scope as they are 'combustion units, such as an engine, boiler or turbine' and do not fall under any of the exclusions in the guidance.

The boilers were commissioned prior to 2018 and will be required to meet the MCPD Emission Limit Values (ELVs) for existing plant by 1 January 2030. The pollutants to be considered under MCPD include oxides of nitrogen (NOx) and nitrogen dioxide (NO_2).

The emergency backup generator is used in abnormal operating circumstances; for the sole purpose of providing power at the Site during an onsite emergency i.e. when mains power is unavailable It is operated for 30 minutes every month for testing. It is therefore used/ tested for less than 50 hours per year (typically for 6 hours per year) and as such is not included within the assessment of emissions to air. The operation of both boilers, under normal operation i.e. one duty and one standby, have been considered as part of this H1 assessment.

1.2 Site location

Parkham Cheese Factory is located at Higher Alminstone Farm, north Devon. The Site operates as a specialist dairy processing facility, primarily focused on the production of hard cheeses, specialising in traditional Cheddar, using milk sourced from local farms. Site activities include milk reception, pasteurisation, curd processing, cheese maturation, and the recovery and reuse of whey and cream by-products.

The factory is situated in a predominantly agricultural setting, with the village of Woolsery approximately 2 km to the north-west and the town of Bideford located about 15 km to the north-east. Access to the Site is via local roads branching from the A39.

The surrounding area consists largely of farmland and open countryside, with a small number of residential properties in the immediate vicinity. There is a PFL-owned residential property adjacent to the Site where the Herd Manager resides.

The Site is in Torridge District Council (TDC) Area, within Devon County Council (DCC). It is not located in an Air Quality Management Area (AQMA) and indeed Torridge District Council does not currently have any declared AQMAs.[1]

There are two statutory designated sites within 10 km of the Site boundary, namely:

- Tintagel-Marsland-Clovelly Coast Special Area of Conservation (SAC) is approximately 2.4 km north from the Site at the nearest point. The SAC is coincident with the Hobby to Peppercombe Site of Special Scientific Interest (SSSI) and Bucks Cross Wood Ancient Woodland (AW).

[1] Torridge District Council (2025) 2025 Air Quality Annual Status Report (ASR), May 2025, Available at: https://www.torridge.gov.uk/article/20227/Air-Quality [Accessed November 2025]

- Culm Grasslands SAC (coincident with Kismeldon Meadows SSSI) which is 2.9 km south of the Site.

There are no Special Protection Areas (SPA) or Ramsar sites located within 10km of the Site. There are no Sites of Special Scientific Interest (SSSIs) within 2km, however both the Tintagel-Marsland-Clovelly Coast SAC and Culm Grasslands SAC are coincident with SSSIs.

There are 10 No. Local Wildlife Sites within 2km of the Site boundary; there is one area of Ancient Woodland, Bucks Cross Wood, located 1.8 km to the north.

1.3 Scope of this report

The processes on Site relevant to emissions to air are described in Section 1; Section 2 outlines the H1 tool, assessment criteria, the assessment methodology and source data; the results of the impact assessment are presented in Section 3; and conclusions are in Section 4. Appendix A shows the H1 input and output tables. Appendix B contains specification data for the kerosene fuel used, as provided by the relevant fuel suppliers.

2 Assessment Methodology

2.1 H1 Emissions to air screening assessment

The H1 screening evaluation has been undertaken following H1 methodology, set out in EA guidance[2,3] and using the EA H1 Assessment Tool spreadsheet (v9.2). **Error! Bookmark not defined.**

2.2 Assessment Criteria

2.2.1 Air Quality Standards and Critical Levels – Human Health

Table 2 sets out those Air quality strategy (AQS) objectives, Ambient Air Directive (AAD) Limit Values and Environmental Assessment Levels (EALs) for the protection of human health that are relevant to this assessment in determining receptor exposure. In the H1 Assessment Tool these are all referred to as EALs.

Table 2 Air Quality Standards for human health

Substance	Emission period	Limit (average)	Standard	Exceedances[1]
Nitrogen dioxide	1 hour	200 µg/m^3	AAD Limit Value	Up to 18 1-hour periods
Nitrogen dioxide	Annual	40 µg/m^3	AAD Limit Value	None
Notes: from https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit [1]number of times a year that the limit may be exceeded AQS: Air quality strategy; AAD: Ambient Air Directive; EAL: Environmental Assessment Level				

2.2.2 Environmental standards for protected conservation areas

The AQS objectives and AAD Limit Values for the protection of vegetation and ecosystems applicable to this assessment are presented in Table 3.

Table 3 Environmental standards for protected conservation areas

Substance	Target	Emission period
Nitrogen oxides (expressed as nitrogen dioxide)[2]	30 µg/m^3	Annual
Nitrogen oxides (expressed as nitrogen dioxide)	75 mg/m^3 200 µg/m^3 for detailed assessments where the ozone is below the AOT40[4] critical level and	Daily

[2] Environment Agency and Department for Environment, Food & Rural Affairs, Air emissions risk assessment for your environmental permit, Available at: https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit [Accessed January 2026]
[3] H1 Software Tool, Version 9.2, Available at: https://admlc.com/h1-tool/ [Accessed January 2026]
[4] The sum of difference between hourly ozone concentration and 40ppb for each hour when the concentration exceeds 40ppb during a relevant growing season (May to July) averaged over five years Available at: AOT40 — European Environment Agency (europa.eu) [Accessed November 2025]

	sulphur dioxide is below the lower critical level of 10 µg/m^3	
Notes: from https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit [1]20 µg/m^3 is an AAD Limit Value if you have nature or conservation sites in the area; [2]30 µg/m^3 is an AAD Limit Value		

2.3 Environment Agency Risk Assessment Guidance

The current evaluation is based on EA risk assessment guidance to determine the significance of the predicted impact. The guidance provides screening criteria for quantifying the environmental impacts of emissions to air, criteria include long and short-term EALs.

The guidance considers initial H1 screening and then detailed modelling. At the initial screening stage, **Test 1**, long-term and short-term concentrations due to the sources entered, referred to as the Process Contribution (PC) can be screened out from further assessment if:

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

The second stage of screening, **Test 2**, considers the background concentration as well as the PC. The Predicted Environmental Concentration (PEC) is the sum of the PC and background concentration. A further assessment is not needed if:

- for human receptors only, the short-term PC is less than 20% of the short-term environmental standards minus twice the long-term background concentration i.e., less than 20% of the 'Headroom', and
- the long-term PEC is less than 70% of the long-term environmental standards.

In accordance with the guidance, it is not necessary to calculate PEC for short-term targets. For an ecological receptor, if the short-term PC exceeds 10% of the EAL, detailed modelling is required.

If the PC cannot be screened out on that basis, the guidance outlines further steps, including detailed modelling, which may lead to a requirement to carry out a cost-benefit analysis.

2.4 H1 Inputs – Process Emissions

Boiler 1 and Boiler 2, situated within the Cheese Store, produce steam used for heating, cleaning equipment and pasteurisation. Boiler 1 and Boiler 2 run alternately (one duty, one standby). One of the two boilers will be operational between the hours of 23:15 – 18:15 i.e. a total of 19 hours per day, for 7 days per week. Each boiler is therefore operational for 39.6% (approximately 40%) of the time (3,468 hours per year).

The sources of emissions and assumed operating profiles are summarised in Table 4.

Table 4 Emission sources and operating profiles

Boiler number (Emission Point)	Series/ Type/ Serial Number	Plant Manufacturer	Assumed operating profile		
			Hrs / day	Annual hours	Assumed Load (%)
Boiler 1 (A1)	01/9097	Cochran	9.5	3,468 (39.6%)	100
Boiler 2 (A2)	01/9096	Cochran	9.5	3,468 (39.6%)	100
Notes: Both boilers are gas oil-fired (kerosene).					

Appendix B contains specification data for the kerosene fuel used in both boilers. Under the MCPD 'gas oil' is defined to include petroleum-derived liquid fuel with certain CN (combined nomenclature) codes. The CN for the kerosene supplied is 2710 19 25; and is therefore included within the MCPD definition of 'gas oil'.

Both boilers (emission points **A1** and **A2**) (1.84 MWthi each) will be required to meet the MCPD ELVs for existing plant fired by gas oil (Annex II, Part 1, Table 1)[5] by 1 January 2030, as follows:

- NOx: 200 mg/Nm^3 (3% O_2), MCP ELV
- SO_2: no limit set but subject to separate fuel-sulphur controls. The specification data (Appendix B) confirm compliance with BS EN 2869:2017 (Class C2) and not exceeding the maximum limit of 0.1% w/w sulphur content.
- Dust: no limit set.

Under the MCPD, specific ELVs are not established for sulphur dioxide (SO_2) or carbon monoxide (CO) arising from the use of gas oil. This omission reflects the intrinsically low sulphur content of gas oil and the fact that CO emissions are principally indicative of combustion efficiency, which is subject to operational monitoring rather than the regulation against an ELV.

In accordance with regulatory/technical benchmarks used in permitting, if the 1.95 MWthi standby diesel generator is operated for more than 500 hours per year, monitoring will be required under the provisions of the permit and ELVs will apply.

The effective stack height has been calculated for each point source in accordance with EA guidance.[6,7] All values of effective stack heights are zero as the stacks are either less than 3m above the building on which the stack is located or are less than the height of the tallest building within the specified distance.[6]

Table 5 details the input data entered into the H1 Assessment Tool is shown in Appendix A.

[5] DIRECTIVE (EU) 2015/2193 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 25 November 2015 on the limitation of emissions of certain pollutants into the air from medium combustion plants
[6] Gov.uk Air emissions risk assessment for your environmental permit: Effective height of release: impact of nearby buildings, Available at: https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit [Accessed January 2026]
[7] Environment Agency (2023) H1 Software Tool User Guide, Version 9.0.

Table 5 Boiler emission parameters

Parameter	Units	Boiler 1	Boiler 2
Location	Easting, Northing	235238, 120766	235237, 120762
Fuel	-	Gas oil	Gas oil
Load	-	Full	Full
Hours of operation	Hours/year	3,468 (39.6%)	3,468 (39.6%)
Electrical output	kWe	n/a	n/a
Thermal input	kWthi	1,844	1,844
Stack height	m	11	11
Effective stack height	m	0	0
Internal diameter at exit	m	0.355	0.355
Volume flow rate (dry)	Nm^3/s	0.51	0.51
Volume flow rate (wet)	Am^3/s	1.16	1.16
Velocity	m/s	11.7	11.7
Exhaust O_2 content	%	4.0	4.0
Exhaust H_2O content	%	10.7	10.7
Temperature	°C	244	244
Exit concentration NOx	mg/Nm^3	200 (ELV, 3% O_2)	200 (ELV, 3% O_2)
Emission rate NOx	g/s	0.10	0.10

Notes:
For each source the location, stack height and hours of operation were advised by Parkhams Farm Ltd.

For each source, the exhaust diameter, exhaust gas volume flow, exhaust temperature (244°C), actual exhaust O_2 % (4.0%) and moisture content (10.7% by volume) at full load firing kerosene are as advised by Cochran Ltd.

Emission rates in this table are shown are for continuous operation; for long-term impact it has been assumed that Boiler 1 and Boiler 2 will each operate 39.6% of the time.

3 Results of the Impact Assessment

Output tables from the H1 Assessment Tool are shown in Appendix A, Table 7 to Table 12. Table 9 shows the long-term and short-term PCs and EALs for each pollutant.

3.1 Air impact screening

Test 1 of the assessment compared the long-term and short-term PCs calculated by the H1 Assessment Tool with the relevant EALs.

Test 2 compared the long-term PECs are compared with the EALs and the short-term PCs with Headroom (EAL minus twice the long-term background concentration).

The results of Air Impact Screening Test 1 and Test 2 are summarised in Table 6. The H1 assessment determined that emissions of NOx require further assessment.

Table 6 Summary of Test 1 and Test 2 Screening results

Substance	Test 1	Test 2
Nitrogen dioxide	Fail	Fail
Nitrogen oxides (as NO_2) (ecological)	Fail	Fail

3.2 Deposition to land

It is not possible to assess deposition to land from air using the current version of the H1 Risk Assessment Tool (version 9.2).**Error! Bookmark not defined.**

4 Conclusion

This H1 Assessment has been completed to assess whether the air quality impact of point source emissions to air at Parkham Farms Cheese Factory at Higher Alminstone Farm can be screened from further assessment.

Emissions from the two gas oil-fired boilers have been considered. The EA's H1 Assessment Tool spreadsheet v9.2 has been used for quantitative assessment.

Test 1 of the assessment compared the long-term and short-term PCs calculated by the H1 Assessment Tool with the relevant EALs; all pollutant-EAL combinations were found to 'fail' Test 1.

Test 2 compared the long-term PECs with the EALs and the short-term PCs with Headroom (EAL minus twice the long-term background concentration); all pollutant-EAL combinations were found to 'fail' Test 2.

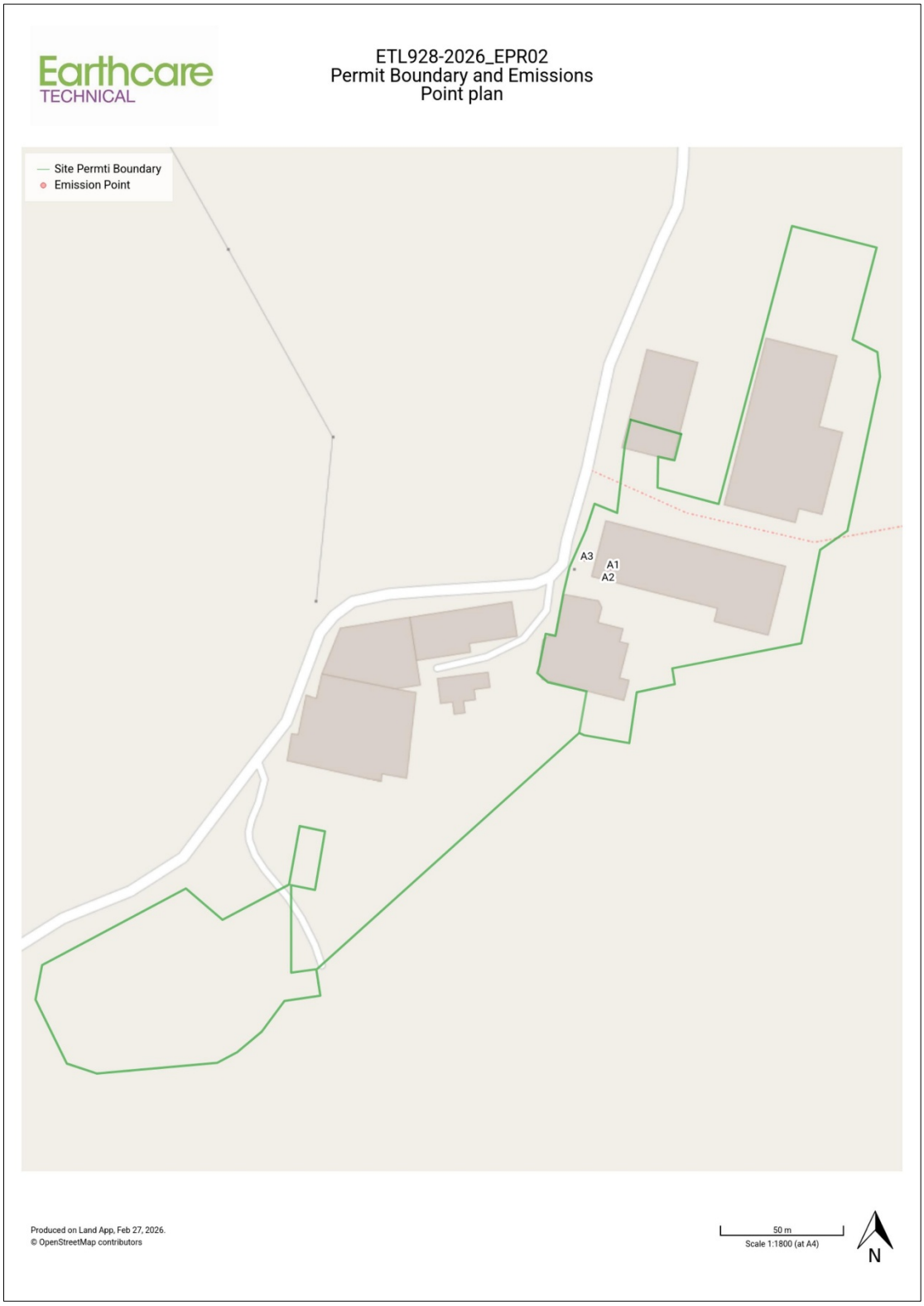
The pollutant-EALs which require further assessment using detailed modelling to be reported in an AQIA include EALs for human health and sensitive ecological receptors:

- Nitrogen dioxide (annual and 1-hour mean)
- Nitrogen oxides (ecological – annual mean and daily mean)

An AQIA has been prepared to support this application.

Figures

Figure 1 Permit Boundary and Emission Points Plan



Appendix A H1 Assessment Tool Input and Output

Table 7 Input: Air release points

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)
Boiler 1	235238, 120766	Combustion	0	148	3900	529	11.7	1853
Boiler 2	235237, 120762	Combustion	0	148	3900	529	11.7	1853

Table 8 Input: Emissions inventory

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)	Measurement basis (short term)	Annual rate (t/yr)	Long term PC (ug/m3)	Short term PC (ug/m3)	Total Flow (m3/h)
Boiler 1	Nitrogen dioxide	Estimated	40%	200	0.10	MCP ELV	200	0.10	MCP ELV	1.30	6.09	200.74	1853.00
Boiler 1	Nitrogen oxides (as NO2) (ecological)	Estimated	40%	200	0.10	MCP ELV	200	0.10	MCP ELV	1.30	6.09	236.88	1853.00
Boiler 2	Nitrogen dioxide	Estimated	40%	200	0.10	MCP ELV	200	0.10	MCP ELV	1.30	6.09	200.74	1853.00
Boiler 2	Nitrogen oxides (as NO2) (ecological)	Estimated	40%	200	0.10	MCP ELV	200	0.10	MCP ELV	1.30	6.09	236.88	1853.00

Table 9 Output: Air impacts – pollutants

Number	Substance	Long term EAL (ug/m3)	Long term PC (ug/m3)	Long term modelled PC	Short term EAL (ug/m3)	Short term PC (ug/m3)	Short term modelled PC
1	Nitrogen dioxide	40	12.066736		200	401.4833333	
2	Nitrogen oxides (as NO2) (ecological)	30	12.066736		75	473.7503333	

Table 10 Output: Air impacts – 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	12.066736	30.17%	fail	200	401.4833333	200.74%	fail
2	Nitrogen oxides (as NO2) (ecological)	30	12.066736	40.22%	fail	75	473.7503333	631.67%	fail

Table 11 Output: Air impacts – 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 (µg/m3)	%PEC of EAL% (Long term)	%PEC of EAL>70%? (long	Short term EAL (ug/m3)	Short term PC (ug/m3)	%PC of the EAL-2*background	%PC of headroom >=20%? (short
1	Nitrogen dioxide	40	12.066736	2.58	32%	14.65	36.62%	pass	200	401.4833333	206.06%	fail
2	Nitrogen oxides (as NO2) (ecological)	30	12.066736	3.16	45%	15.23	50.76%	pass	75	473.7503333	689.79%	fail

Table 12 Results: Air Assessment

Option	Substance	Test 1	Test 2
1	Nitrogen dioxide	Fail	Fail
1	Nitrogen oxides (as NO2) (ecological)	Fail	Fail

Appendix B Boiler fuel specification data

Technical Data Sheet

Kerosene

Description:
Domestic burning fuel.

Specification:
BS EN 2869:2017 (Class C2)

Date of issue:
15th July 2024

Property	Test Method	Units	Limits	
			Min	Max
Appearance (@ Ambient Temp)	Visual		Clear and bright. Free from Visible Sediment & Water.	
Char Value	BS 2000-10	mg/kg		20
Copper Corrosion	EN ISO 2160	2hr @ 100ºC		Class 1
Density @ 15ºC	EN ISO 12185	kg/l @ 15 ºC	0.7750	0.8400
Density % Vol Rec @ 200ºC % Vol Rec @ 210ºC % Vol Rec @ 240ºC Final Boiling Point	EN ISO 3405	 Vol % Vol % Vol % ºC	 15.0 50.0	 90.0 300.0
Doctor Test IP 30 or Mercaptan Sulphur	IP 30 ASTM D3227/IP 342	 % Wt		-ve 0.0025
Flash Point	BS EN ISO 13736	ºC	38.0	
Gross Specific Energy	ASTM D3338	Mj/Kg		42.8
Odour			Merchantable	
Smoke Point	IP 598	mm	1.8	
Sulphur	BS EN 8754	% (m/m)		0.1
Visco @ 40ºC	BS EN ISO 3104	mm^2/s	1.00	2.00

Notes:
1. Here are the notes. Here are the notes. Here are the notes. Here are the notes There are no seasonal requirements for Kerosene
2. Class C2 is a Kerosine designed for vaporising or atomizing burners in appliances connected to flues
3. Latest test methods or technical equivalents used
4. This product shall always meet BS EN 2869:2017 Class C2 (Kerosene)

Watson Fuels Callow Park, Callow Hill, Brinkworth, Chippenham, Wiltshire, SN15 5FD
www.watsonfuels.co.uk

WATSON
A World Fuel Services company