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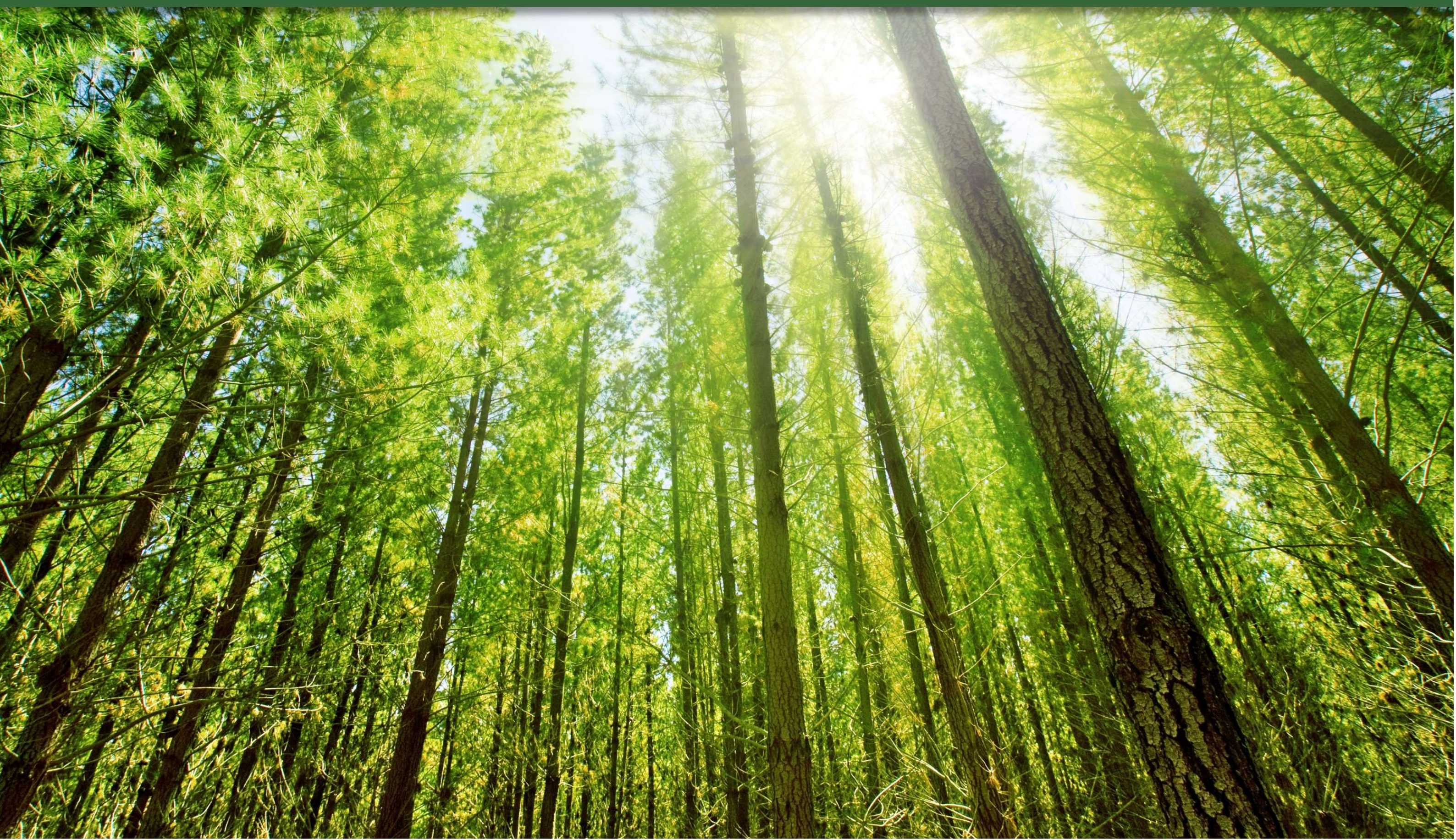
Non-Technical Summary

v1.0

Environmental and sustainability solutions provided to

Haworth Scouring Company Limited



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Client	Haworth Scouring Company Limited
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0.2	Internal review	31/10/2025
1.0	Final for submission	14/11/2025
1.1	Draft update	09/02/2026

CONTENTS

1.0 INTRODUCTION

1.1 Site address

Haworth Scouring Company Ltd

Cashmere Works

Birksland Street

Bradford

West Yorkshire

BD3 9SX

1.2 Site grid reference

SE 17900 32700

1.3 Site description

The site is situated 1.3km east of Bradford city centre and comprises an irregular area of approximately 8 acres. The site is surrounded by mixed industrial units and some residential properties. The facility is surrounded by minor roads on four sides, with the fifth (south) side being the boundary of the main Leeds to Bradford railway line.

Figure 1-1: Google Earth image of the area

The north side of the site is bounded partly by Gibson Street, with residential housing on the opposite side. The east side of the site is bounded by the end of Laurel Street which has industrial premises on its opposite side. The south and west sides of the site are bounded by Birkshall Lane and Birksland Street respectively, both of which are largely used by industrial traffic only. The entire site is surrounded by perimeter or building walls and slopes to the northwest.

The installation operates as a textiles plant which washes and dries raw fleeces to produce clean, dry wool fibre for sale or onward processing. The main activities are receipt of raw materials and fuels, product processing (heating, drying, washing, and cleaning) and despatch of finished product. Ancillary processes include on-site treatment of effluents and recovery of wool grease.

1.4 Authorisations

With reference to the Environmental Permitting Regulations 2016 Schedule 2 Part 2 Chapter 6 Part A(1)(a), Haworth Scouring Company Limited (hereon referred to as HSC) currently holds an environmental permit (EPR/BS6025IF/V005) for the ‘pre-treating (by operations such as washing, bleaching or mercerisation) or dyeing fibres of textiles in a plant with a treatment capacity of more than 10 tonnes per day’. This activity is limited to the scouring of loose wool. The site has an existing Combined Heat and Power (CHP) unit with a net rated thermal input of 3.557MWth. The CHP’s purpose is to generate electricity, hot water and steam to reduce the import of electricity to power machinery and natural gas to fire the existing boiler. The CHP is classified as a Medium Combustion Plant in accordance with Schedule 25A of the Environmental Permitting Regulations, and as a Tranche B Specified Generator in accordance with Schedule 25B. The site also has an existing gas fired boiler with a net rated thermal input of 3.909MWth which is used to generate hot water and steam. The boiler is classified as a Medium Combustion Plant under Schedule 25A of the Environmental Permitting Regulations.

1.5 Planning permissions

The site operates under full planning permissions for all activities.

1.6 Reason for application

HSC proposes the integration of an Anaerobic Digestion (AD) stage as a pre-treatment phase situated upstream of the existing Effluent Treatment Plant (ETP). This configuration aligns with Environment Agency (EA) recommendations, which identify anaerobic digestion as the preferred treatment technology for high-strength organic effluent of this nature. To facilitate this, a permit variation is sought to incorporate both the AD infrastructure and a co-located CHP unit.

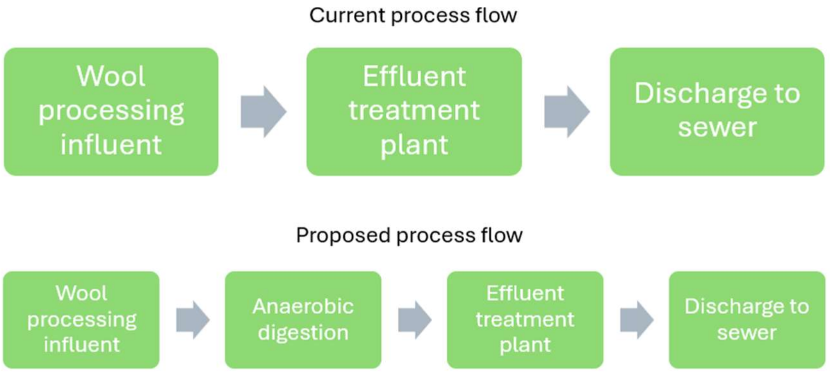

Figure 1-2: Process flow diagram

The inclusion of the AD stage serves as a primary biological stabiliser, significantly enhancing the overall efficiency of the site's wastewater management.

Key technical benefits include:

<u>Enhanced treatability:</u> AD pre-treatment reduces the organic load (COD/BOD), rendering the washwater more treatable by final processing within the existing ETP prior to discharge.

<u>Waste minimisation:</u> The process is designed to reduce total sludge production and lower the chemical demand of subsequent treatment stages.

<u>Resource recovery:</u> Biogas generated during digestion is captured and combusted within the CHP engine to produce renewable electricity and thermal energy, which are redistributed to power on-site operations and the wool scouring process. The system is designed as a fully enclosed circuit to prevent fugitive emissions.

<u>Flare system</u>: An enclosed flare (NGR SE 17854 32664) will be installed at the AD site. This serves as a critical safety component, providing emergency pressure relief and controlled combustion of excess biogas if the gas holder reaches maximum capacity.

Final discharge: Following the AD stage, the pre-treated effluent undergoes final polishing at the ETP—the terminal treatment stage—prior to its regulated discharge to the foul sewer.

Table 1-1: Technical design and operational parameters

Category	Parameter	Specification / Target Value
System configuration	Process type	Single-stage, parallel stream digestion
	Number of vessels	7 (3 primary, 3 secondary, 1 buffer)
	Individual vessel capacity	$135m^3$(total) $123m^3$ (working)
	Total system working volume	$861m^3$ (including buffer)
Feedstock details	Material type	Wool scouring washwater (aqueous)
	Primary objective	COD reduction and organic conversion
	Organic loading method	SCADA-automated batch loading
	Batch load size	Up to 1/3 of vessel volume per cycle
Process conditions	Operating temperature	36°C to 46°C (mesophilic)
	Typical hydraulic retention time	2–3 days (variable based on influent)
	Biological residence time	< 9 hours (achieved during pilot testing)
	Mixing technology	Low-intensity gas-injection (non-CSTR)
Biogas composition	Methane (CH_4)	70% – 75%
	Carbon Dioxide (CO_2)	20% – 25%
	Trace gases	H_2S, N_2, moisture
Emissions and safety	Primary safety device	Enclosed flare (NGR SE 17854 32664)
	Desulphurisation	In-vessel microbial fixation
	Foam mitigation	7th buffer tank + Foam Alleviation Devices (FADs)
Effluent management	Final treatment route	Direct pipeline to existing on-site ETP
	Solid waste handling	Dewatered sludge via bunded Ro-Ro skip

2.0 OVERVIEW OF PROPOSED OPERATIONS

2.1 Current operations

The scouring process is described in these steps:

- Greasy wool containing wool grease (lanolin), dirt and other vegetable material is loaded onto a large conveyor and pre-blended in an accumulator bin.
- Excess dirt and vegetable matter are removed from the wool prior to washing without damage to the fibre.
- Effluent Treatment Plant (ETP) treats washwater and grease from the raw wool scouring process prior to discharge to sewer (emission point S1), listed as Directly Associated Activity AR4.
- The greasy wool is conveyed through a series of temperature-controlled wash bowls containing biodegradable detergent which removes the wool grease and dirt and debris from the fibres before going through a series of rinse bowls.
- A series of specific temperature-controlled dryers then dry the wool, and a moisture management system provides a best fit for specified moisture regain values requested by a customer.
- Wool is press packed in bales of approximately 300-350kg and stored for export to the customer.

2.2 Proposed operations

The washwater from the raw wool scouring process at HSC is characterised by extremely high Chemical Oxygen Demand (COD) and high solids content. These parameters not only have the potential to impact upon the environment when discharged to public sewer but are also used to determine the cost of discharge. Lowering these parameters before discharge therefore not only benefits the environment but also reduces operational costs. HSC has put in place efficient wool grease capture from the effluent and a physico-chemical ETP to reduce COD and solids by around 90% but are hoping to reduce these further with the insertion of a digestion stage to their existing effluent treatment system.

An additional CHP unit will be co-installed at the AD site, which will be fired on biogas produced from the digestion of the washwater that will be combusted in the CHP to produce electricity and heat which will be used on the site. This will further reduce the site's dependency on electricity and gas from the national grid.

2.3 Process description

The washwater feedstock from the scouring process will be pumped to the existing pre-digestion effluent tank via sealed pipework and then on to the digestion system. Process parameters will be carefully monitored at all times through the SCADA system.

The process will use a one-stage digestion process organised into three parallel treatment lines. Each line comprises two tanks —a primary and a secondary tank—each featuring a total capacity of 135m^3 and a functional working volume of 123m^3. All three secondary tanks discharge into the seventh tank, which operates as a centralised buffer tank for the system.

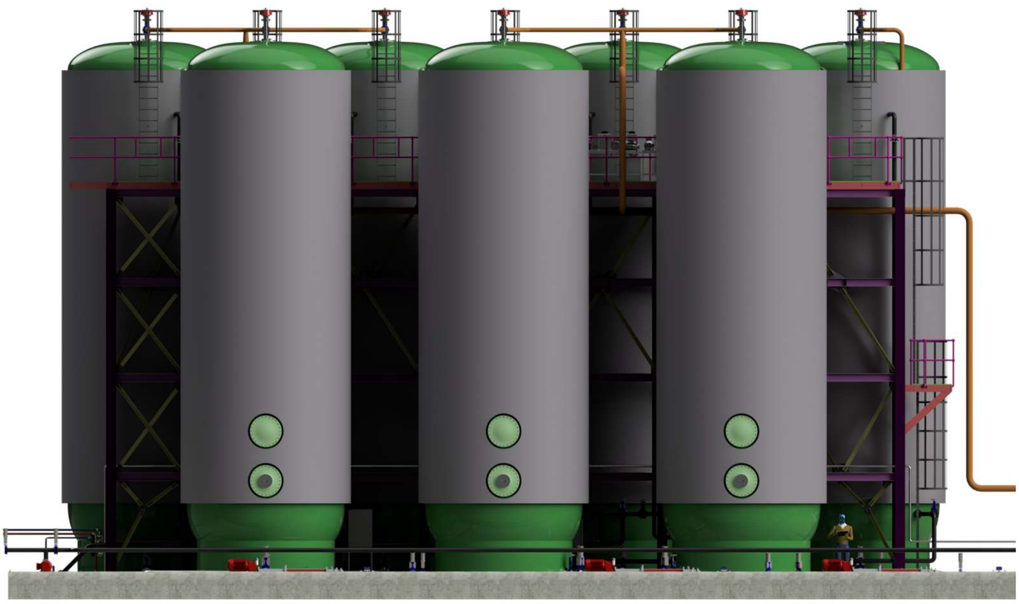

Figure 2-1: Vertical digester diagram

The existing input buffer tank will store the washwater feedstock prior to digestion with the seventh buffer tank storing the treated effluent prior to transfer to the existing ETP. The tanks are contained within an area of the site that is bunded and contained in line with the CIRIA C736 Guidance.

Feedstock management and loading

The delivery of washwater feedstock from the wool scouring process is automated via a SCADA system, modulated by the inventory levels in the input buffer tank. Unlike conventional systems optimised for biogas yields, the primary objective of this digestion stage is the reduction of Chemical Oxygen Demand (COD) and the maximisation of organic conversion for all influent washwater.

To maintain hydraulic stability, all primary and secondary digesters remain at constant capacity. This is achieved through simultaneous loading and unloading cycles performed multiple times daily, with individual batch loads representing up to one-third of the vessel volume.

Reactor dynamics and mixing

The system does not function as a Continuous Stirred Tank Reactor (CSTR); instead, it operates as a biological filtering process with characteristics more like plug-flow kinetics.

Mixing philosophy: Contents are circulated through the medium using gas injection. This is not intended for high-shear mixing but rather for low-intensity agitation to prevent short-circuiting (channelling) and ensure uniform contact.

Solids management: This agitation is integral to the Fre-energy de-gritting process, preventing the accumulation of inorganic settleable solids.

Process stability: Uniform circulation prevents the formation of localised Volatile Fatty Acid (VFA) pockets, which otherwise lead to gas "burping" and unstable biological conditions.

Foam and sulphur mitigation

Foaming: Conventional biological foaming is mitigated by the low dry matter content of the feedstock. However, residual detergents may cause non-biological surfactants to foam. This is managed via the digester headspace and secondary Foam Alleviation Devices (FADs).

Desulphurisation: Biological desulphurisation (microbial fixation) occurs within the digesters and storage vessels. This reduces Hydrogen Sulphide (H_2S) concentrations to protect the Combined Heat and Power (CHP) unit from corrosion.

Thermal conditions and residence time

The digesters are maintained at a mesophilic temperature range of between 36°C and 46°C. Due to the small particle size of the washwater feedstock, digestion is rapid; with pilot testing indicating complete digestion achieved in less than 9 hours. While the hydraulic retention time (HRT) varies based on factory effluent rates (typically 2–3 days), there is no fixed minimum retention time required for biological efficacy.

Gas production and emissions control

The digestion process is fully sealed, ensuring an emission-free operation.

Gas composition: The process yields a methane-rich biogas, typically comprising 70%–75% CH_4 and 20%–25% CO_2, with trace N_2 and H_2S

Utilisation: Biogas is collected via a manifold, cooled, and scrubbed to remove contaminants before passing through a carbon filter for use in the CHP engine.

Emergency handling: A dedicated flare stack is installed to safely combust excess biogas in the event the gas holder reaches maximum capacity.

Output and waste management

Post-digestion, the effluent is transferred via pipeline to the existing Effluent Treatment Plant (ETP).

Solid waste: Sludge generated through dewatering is collected in a bunded roll-on roll-off skip and removed from the site daily.

Aqueous discharge: Process water is discharged to the mains sewer under the existing discharge consent and will conform to the existing Emission Limit Values (ELVs).

Chemical consumption: The AD phase requires no additional chemical inputs beyond those already utilised in the current ETP process.

2.4 Emissions assessment – Pressure Relief Valves (PRVs)

The AD plant incorporates pressure relief valves (PRVs) on biogas-containing infrastructure, including digester headspaces and gas storage systems. The PRVs are a safety-critical, passive engineering control designed to protect plant integrity by protecting against over and under pressure situation should abnormal operating conditions arise.

PRVs are not designed for routine operation and remain closed under normal plant conditions. Discharge occurs only under infrequent, abnormal or emergency scenarios, such as:

- Simultaneous failure of downstream gas utilisation equipment, i.e., CHP and flare shutdown
- Blockage or malfunction within the gas handling system
- Unexpected rapid biogas generation in excess of the gas holder capacity.
- Control system failure leading to over-pressurisation

PRVs are installed on the digesters and under BAT-compliant operation:

- Remain closed during normal operation
- System pressures are controlled through automated process controls
- Biogas is directed preferentially to the CHP, or to the flare should the gas tank be full.
- PRV and flare activations are recorded.

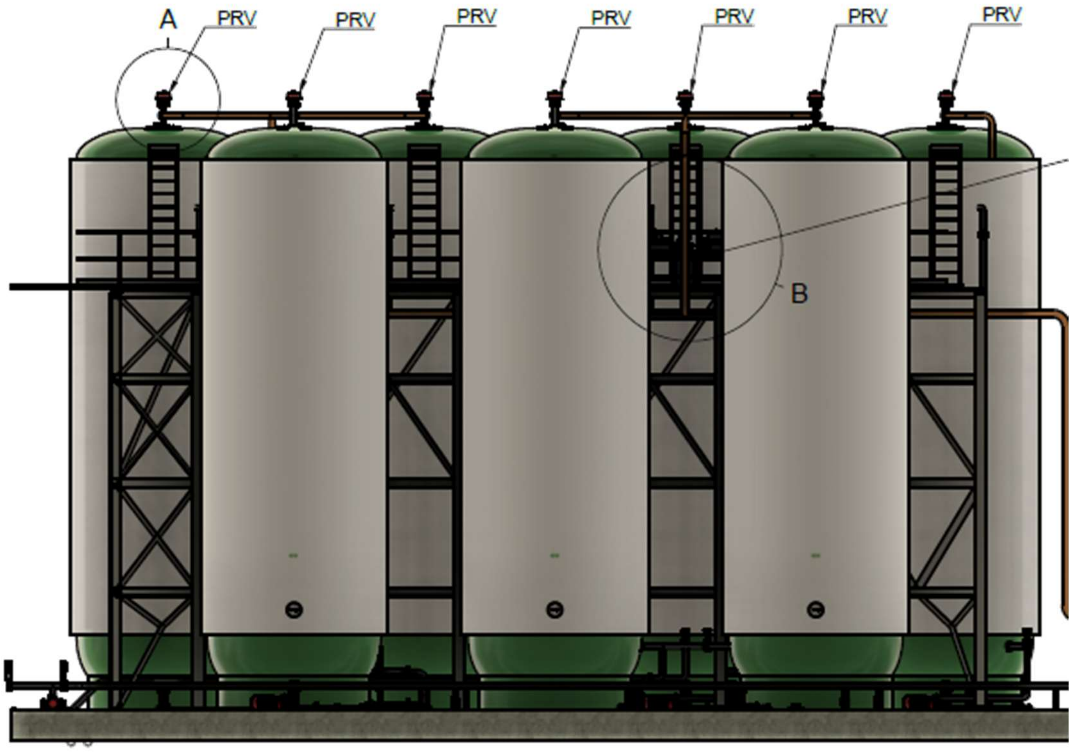

Figure 2-2: Tank PRV position diagram

PRV discharge occurs only if system pressure exceeds design limits due to abnormal or emergency conditions, consistent with BAT conclusions relating to accident prevention and mitigation.

Table 2-1: Emission points

Item	NGR
Digester tank 1 PRV	SE 17865 32648
Digester tank 2 PRV	SE 17871 32654
Digester tank 3 PRV	SE 17861 32643
Digester tank 4 PRV	SE 17861 32643
Digester tank 5 PRV	SE 17860 32646
Digester tank 6 PRV	SE 17860 32646
Digester tank 7 PRV	SE 17860 32646
Flare	SE 17854 32664
CHP	SE 17847 32663
S1 (to sewer)	SE 17958 32684

2.5 Operational layout

The operational layout of the facility is shown in the Site Layout Plan. The variation does not alter the existing permitted site boundary or the point at which the effluent is discharged to foul sewer.

The site comprises of raw wool warehousing, a raw wool sorting and bailing area, an office building, car park, a raw bale opening and blending area, a wool scouring area, a wool drying area, a wool de-dusting area, a dust plant, a grease plant, an effluent plant, a blending and baling of sourced wool area, warehousing for scoured wool, a carding and combing area and a loading yard.

The site has a foul drainage system in place so that all contaminated surface water is contained. The point at which the ETP discharges to the foul sewer is adjacent to the plant itself and will not be replaced.

Domestic foul water is discharged to the same sewer at a different point. There is a freshwater abstraction point along with chemical storage areas.

Effluent from the raw wool scour plants is currently directed to the on-site ETP before discharge to foul sewer, this stage of the process will not alter other than the effluent will now have passed through the digestion phase before feeding the ETP. The effluent is transported to the treatment plant either in water resistant concrete lined channels or in plastic piping to minimise leakage to the environment.

The influent and effluent streams will be piped to the AD area of the site which is bunded and contained in line with the CIRIA C736 guidance. Following treatment in this area, the effluent will be transferred to the existing on-site ETP for final treatment prior to discharge to the foul sewer via emission point S1 (trade effluent consent agreement no. YW/1165/95C).

Water collection on the ground of the site and from roofs and gutters is channelled to drains in the yard around the scour, warehouse and loading areas. These discharge directly to the sewer.

The area under the grit sump is covered by a membrane and an impervious concrete floor slab to prevent process liquors or effluents penetrating the ground under the buildings. The purpose of the membrane is to allow leaks from tanks to be detected, in this case the tanks are all above ground, except the sump which includes a leak membrane.

The site layout including the proposed AD plant is presented below in Figure 2-4.

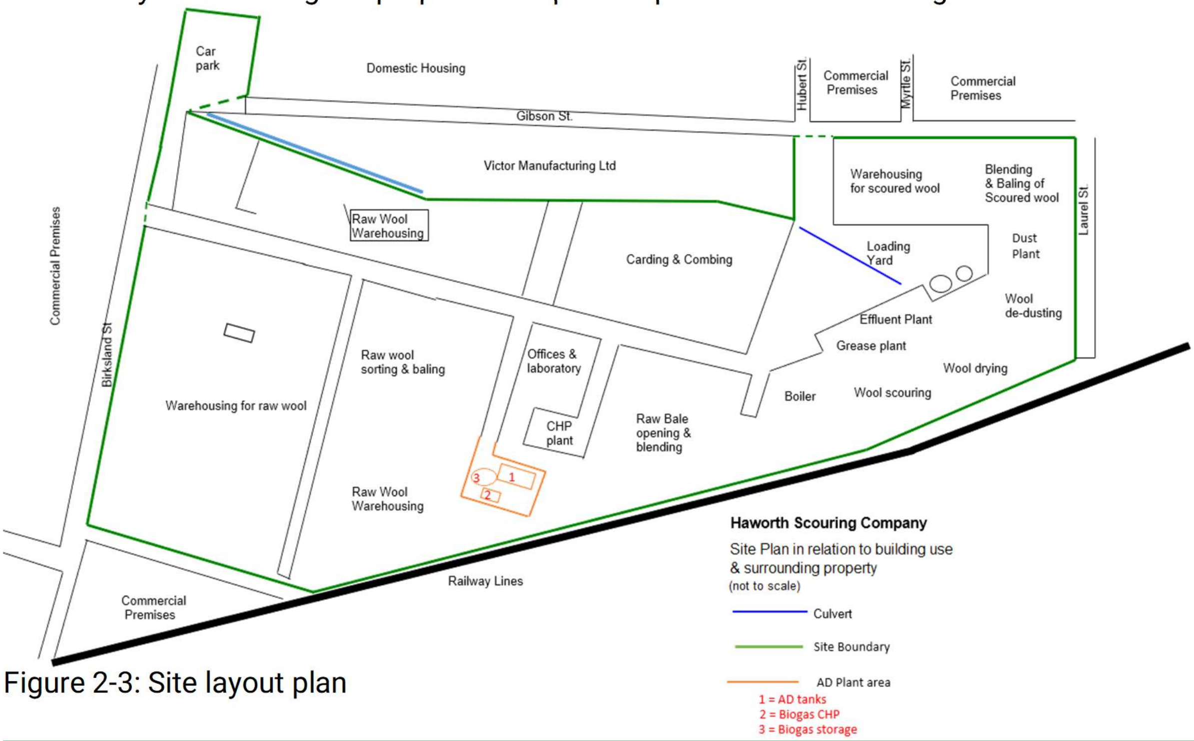

Figure 2-3: Site layout plan

2.6 Wastes to be digested

The influent washwater supplied to the digesters is identical to the washwater feedstock currently treated by the Effluent Treatment Plant (ETP) prior to discharge. Consequently, the anaerobic digestion phase requires no additional chemical inputs beyond those already integrated into the existing ETP process. Following digestion, the effluent is transferred via pipeline back to the ETP for final processing and polishing before being discharged to the mains sewer

2.7 Calculated capacity

The proposed variation does not alter the existing permitted calculated capacity.

2.8 Directly Associated Activities (DAA)

The Directly Associated Activities with the system are:

- Storage and handling of raw materials, finished product and wastes
- Heat, steam, and electrical power supply
- Treatment of effluent and grease recovery in an existing on site effluent treatment plant
- Treatment of effluent (COD Destruction) in the Anaerobic Digestion.
- Biogas combustion
- Flaring of biogas in emergencies
- Surface water drainage / collection of uncontaminated site surface waters

3.0 OPERATING PROCEDURES

3.1 Site operational hours

The site operates 24 hours a day, 5 days a week, 47 weeks a year. The digester may operate automatically over the weekends as turning it off isn't immediate and it may need to process effluent in the input buffer tank in preparation for Monday

3.2 Technical Standards and Control Measures

HSC operate to industry best standards and have been accredited and certified for the following standards:

- ISO 9001:2015 – Quality Management Systems
- ISO 14001:2015 – Environmental Management Systems
- Soil association certified to GOTS standards
- Soil association certified to OEKO-TEX standards
- Red Tractor
- Nordic Swan
- Combined Heat and Power Quality Assurance (CHPQA) Programme

The critical control points governing these technical standards are to be applied to this site and fully incorporated into the site's Standard Operating Procedures. A documented list of technical standards that the site will be operating to is provided in Appendix B.

4.0 ENVIRONMENTAL IMPACT AND MITIGATION MEASURES

All facilities have an impact on the environment around them. A H1 Risk Assessment has been undertaken has been undertaken to evaluate the environmental impact of the emissions from the facility (document reference: H1 Risk Assessment). HSC employ process management and monitoring techniques which will mitigate the environmental impact within the sections listed below.

4.1 Odour

The site has a comprehensive Odour Management Plan which details how odour is managed at the site. The site undertakes a number of practical measures to help minimise odour, including but not limited to:

- Regular inspection and cleaning of operational areas to prevent accumulation of potentially odorous material
- Implementing effective process monitoring and management systems
- Daily offtake of digestate cake following anaerobic digestion
- Daily inspection of the site's drainage system to always ensure its efficient operation
- Covering of skips and vehicles travelling to and from the site

4.2 Bioaerosols

A Bioaerosol Risk Assessment has been prepared, following M9 - Environmental monitoring of bioaerosols at regulated facilities as part of this application. The site is unlikely to be a high-risk site for bioaerosol emissions which is supported by the EA 'Guidance for developments requiring planning permission and environmental permits' (LIT_7260_bba627.pdf) which states that they "do not consider bioaerosols from anaerobic digestion a serious concern". However, measures are in place to prevent the release of bioaerosols as the effluent is transferred to the digestion system solely by pipework. The effluent material input material is 96.5% water.

4.3 Dust

Measures to minimise dust from operations are detailed in the sites Dust and Emissions Management Plan. The site undertakes several practical measures to reduce dust emissions such as the installation of dust extraction systems, covering lorries and skips before leaving site, damping down before sheeting, and regular maintenance and inspection of process equipment. The AD process phase will not produce dust.

4.4 Surface water

The AD site has an engineered fall which ensures that all uncontaminated rainwater is directed into a rainwater drainage channel which will be integrated in the wall of the catastrophic failure retention bund that will surround the AD tanks. There is also a drainage channel that runs on the southwest and northwest sides of the "clean" area that channels uncontaminated rainwater to the rainwater sump. Collected rainwater is then captured within a rainwater sump equipped with a sump pump for pumping collected rainwater to the site's integrated drainage system.

Within the main bund that will surround the AD tanks, there are two drainage channels: one that runs between the two rows of AD tanks, and one that runs alongside the site's pump system. Captured liquid comprises process effluent, which is re-circulated back into the front of the process. Any solids that accumulate in the grit sump are dug out for subsequent disposal. In the event of a failure, the grit sump will fill and activate a float switch which will cut power to the rainwater sump pump thereby preventing process liquid from being pumped out of the bund.

4.5 Sensitive receptors

The sensitive receptors located within 250m of the site boundary are detailed in Table 1 below.

Table 4-1: Sensitive receptors within 250m of site boundary

Receptor reference	Receptor description/land-use type	Direction from site (from true north)	Approximate distance to site boundary (m)
1	Residential receptor – garden	Northwest	58

2	Residential receptor – garden	Northwest	105
3	Residential dwelling	Northwest	87
4	Residential dwelling	Northwest	72
5	Residential dwelling	Northwest	63
6	Residential dwelling	West-northwest	74
7	Residential dwelling	North	51
8	Residential dwelling	North-northeast	65
9	Residential receptor – garden	North-northwest	68
10	Residential receptor – garden	North	50
11	Residential receptor – garden	Northeast	63
12	Residential receptor – garden	East-northeast	100
13	Redmire Van Hire	West-southwest	50
14	Brownie Points	West-southwest	72
15	Adams Foodservice Mount Street	South-southeast	178
16	Industrial Unit	South-southeast	164
17	Womenzone	East-northeast	39
18	Chaiiwala	Northeast	180
19	Abaseen	Northeast	202

20	Dzire Lounge	East-northeast	207
21	Continental Kitchen and Bar	East-southeast	116
22	Commercial premises and café cluster	Northwest	150
23	Café and Autoworks vehicle repair shop	West-northwest	220
24	Commercial premises	North-northeast	141
25	Commercial and retail premises	Northeast	247
26	Co-op Academy Pennyoaks	East-northeast	39

APPENDIX A – COMMISSIONING SCHEDULE FOR HAWORTH SCOURING AD0027

1. Phase 1 - Wet testing of tanks and pipe work (7 Days)

1.1. Purpose:

- Ensure hydrostatic integrity of tanks
- Ensure hydrostatic integrity of heat exchangers
- Ensure hydrostatic integrity of feedstock pipework
- Ensure tanks and gas pipework is sealed
- Ensure PRV's trigger at correct pressures
- Commission feed pumps
- Commission circulation pumps
- Commission sump pump
- Commission valve control system
- Commission monitoring sensors

1.2. Method:

All wet testing will be completed using clean water, this will ensure that any spillage or leakage, which is likely during this process, does not represent a hazard or disposal issue.

Valve control system will be checked before any water introduced to the system.

Heat exchanger 1 is immediately after the initial feed pump so can be checked whenever loading using that pump.

The hot water pipework feeding the various heat exchangers can be pressurised and checked for leaks during this test period.

1.2.1. General fill sequence:

- Foam alleviation filled with water
- Tank gas connection isolated from main network and pressure sensor fitted
- Water pumped into tank until foam alleviation overflow is reached.
- PRV monitored in conjunction with gas pressure sensor to ensure correct triggering.

- Washing up liquid used to find any air leaks.
- Level sensor lower setpoints determined as water level passes them.
- Level sensor upper setpoints determined when tanks fully filled.
- Liquid in tank circulated for 4 hours, level monitored as indicator for leaks. Circulation flow meter and temperature sensor checked for functionality during this period.
- Pipework and heat exchanger checked for leaks.
- Temperature sensors checked for functionality.

1.2.2. General transfer sequence:

- Initial unload through unloading pipework until the level drops below the unload flange.
- Further unloading completed through degritting pipework.
- If the tank being unloaded is empty but the tank being loaded is not full to the foam alleviation, then additional water is added through the initial feed pump.
- PRV and pressure sensor monitored to ensure negative pressure protection triggers correctly.

1.2.3. Tank fill order:

- Tank 1
    - Loaded using initial feed pump.
    - Circulated using circulation pump 1 through heat exchanger 2.
- Transfer – Tank 1 to 4
    - Transferred using transfer pump 1
    - Circulated using circulation pump 2 through heat exchanger 3.
- Transfer – Tank 4 to 2
    - Transferred through grit sump
        - Tank 4 to grit sump using transfer pump 2
        - Grit sump to Tank 2 using grit sump pump followed by initial feed pump
    - Circulated using circulation pump 1 through heat exchanger 2.
- Transfer – Tank 2 to Tank 5
    - Transferred using transfer pump 1

    - Circulated using circulation pump 2 through heat exchanger 3.
- Transfer – Tank 5 to 3
    - Transferred through grit sump
        - Tank 5 to grit sump using transfer pump 2
        - Grit sump to Tank 3 using grit sump pump followed by initial feed pump
    - Circulated using circulation pump 1 through heat exchanger 2.
- Transfer – Tank 3 to Tank 6
    - Transferred using transfer pump 1
    - Circulated using circulation pump 2 through heat exchanger 3.
- Transfer – Tank 6 to Tank 4
    - Transferred using transfer pump 2
    - This tank does not have circulation and should just be left to stand.

After this process has been completed the water can be pumped from tank 7 up to HSC's decanter, using transfer pump 3. This will enable us to check for leaks in this pipework and to check that the data connection between the two systems is functional.

2. Phase 2 – Inoculation (24 days)

From this point on Personal gas detectors must be worn on site. ATEX areas – Around the top gantry and the PRV's on the tank come into force. Briefing on ATEX risks to be included for site staff and visitors.

2.1. Purpose:

- Instantiate and develop bacterial colony
- Start and test automated control system

2.2. Method:

A starter culture is required to initiate the bacterial colony; this will be supplied through digestate supplied by an existing digester.

Any gas evolved during the inoculation process when it has reached a burnable quality (Ch4 > 48% & O2 < 1%) to be stored in the gas holder and flared off when sufficient volume has been *stored. Note. The gas train to the gas holder and flare needs to be complete and the flare in a position to be commissioned.*

2.2.1. General inoculation loading process:

Tank half filled with Haworth washings.

- 10m^3 of inoculant loaded into tank.
  - Preferred – Tanker connected to system in place of sump pump and material loaded using initial feed pump
  - Backup – Tanker unloaded into grit sump and inoculant loaded through sump pump and initial feed pump
- Tank filled to operating level with Haworth washings.
- Tank contents circulated for 24 days with circulation providing the heat to maintain appropriate temperature.
- Gas mixing run at minimal level. *Starting at 5 mins per day.*
- Daily FOS/TAC testing:
  - If FOS/TAC falls below 0.17 more feedstock to be added
- Daily COD testing:
  - If COD falls below 24,000 then more feedstock to be added

After a tank has been filled, the next tank can begin the inoculation process.

Note: The figures for FOS/TAC and COD are an indication, and we may well need to review these during the commissioning process. – It is important not to overfeed the biology in the early stages.

3. Phase 3 – Establishing feeding (5 Weeks)

Personal gas detectors must be worn on site. ATEX areas – Around the top gantry and the PRV's on the tank come into force. Briefing on ATEX risks must be included for site staff and visitors.

3.1. Purpose:

- To ramp feeding up to full feed rate.
- To ensure that the automated control system operates as intended.

3.2. Method:

Once the tests indicate that the colony has established and the process is digesting, we will begin regular feeding of the digesters. Initial feeding will be 20m^3 per day, this volume will be increased periodically until the system feed rate has been achieved.

Fresh feedstock will be loaded into the first three tanks, excess in these primary tanks will be pumped into the second three tanks, excess from the secondary tanks will be pumped to the 7th tank and excess from the 7th tank will be pumped back to HSC's existing decanter.

3.2.1. Expected loading rate:

- Week 1
  - Feed 20m^3 / day per primary tank.
  - Mixing 1 min / hour.
- Week 2
  - Feed 40m^3 / day per primary tank.
  - Mixing 1 min / 30 Mins.
- Week 3
  - Feed 60m^3 / day per primary tank.
  - Mixing 1 min / 15 Mins.
- Week 4
  - 80m^3 / day per primary tank.
  - Mixing 1 min / 15 Mins.
- Week 5 Full loading.

Note*: HSC might decide to feed the first 6 tanks in parallel. This will depend upon what we are seeing in the FOS/TAC and COD test for each of the tanks.*

Note: The feeding quantities and mixing rates quoted are indicators and the values may need to be adjusted dependent upon the progress being made. It is important to not over feed the system at the early stages.

APPENDIX B – TECHNICAL STANDARDS SUMMARY

The table below presents a list of technical documents, with reference, for the process of anaerobic digestion. These documents have been utilised in order to fulfil the requirements of the bespoke permit application and will continue to be in use as point of reference during the operational life of the permitted site. Documents have been sourced from both regulatory agencies and industry led organisations.

Anaerobic Digestion – Technical Standards	
Technical Guidance Note	**Document Reference**
Develop a management system: environmental permits	DEFRA and EA Guidance
Controlling and monitoring emissions for your environmental permit	DEFRA and EA Guidance
Risk assessments for your environmental permit	DEFRA and EA Guidance
General guide to pollution prevention	EA Pollution Prevention Guidance
H1 EA overview of Environmental Risk Assessments for Permits	EA Pollution Prevention Guidance
Odour management: comply with your environmental permit	EA Pollution Prevention Guidance
Biological waste treatment: appropriate measures for permitted facilities	EA Guidance
Best Available Techniques (BAT) Reference Document for Waste Treatment	Best Available Techniques (BAT) Reference Document for Waste treatment Industrial Emissions Directive 2010/75/EU (Integrated Pollution Prevention and Control); EUR 29362 EN; Publications Office of the