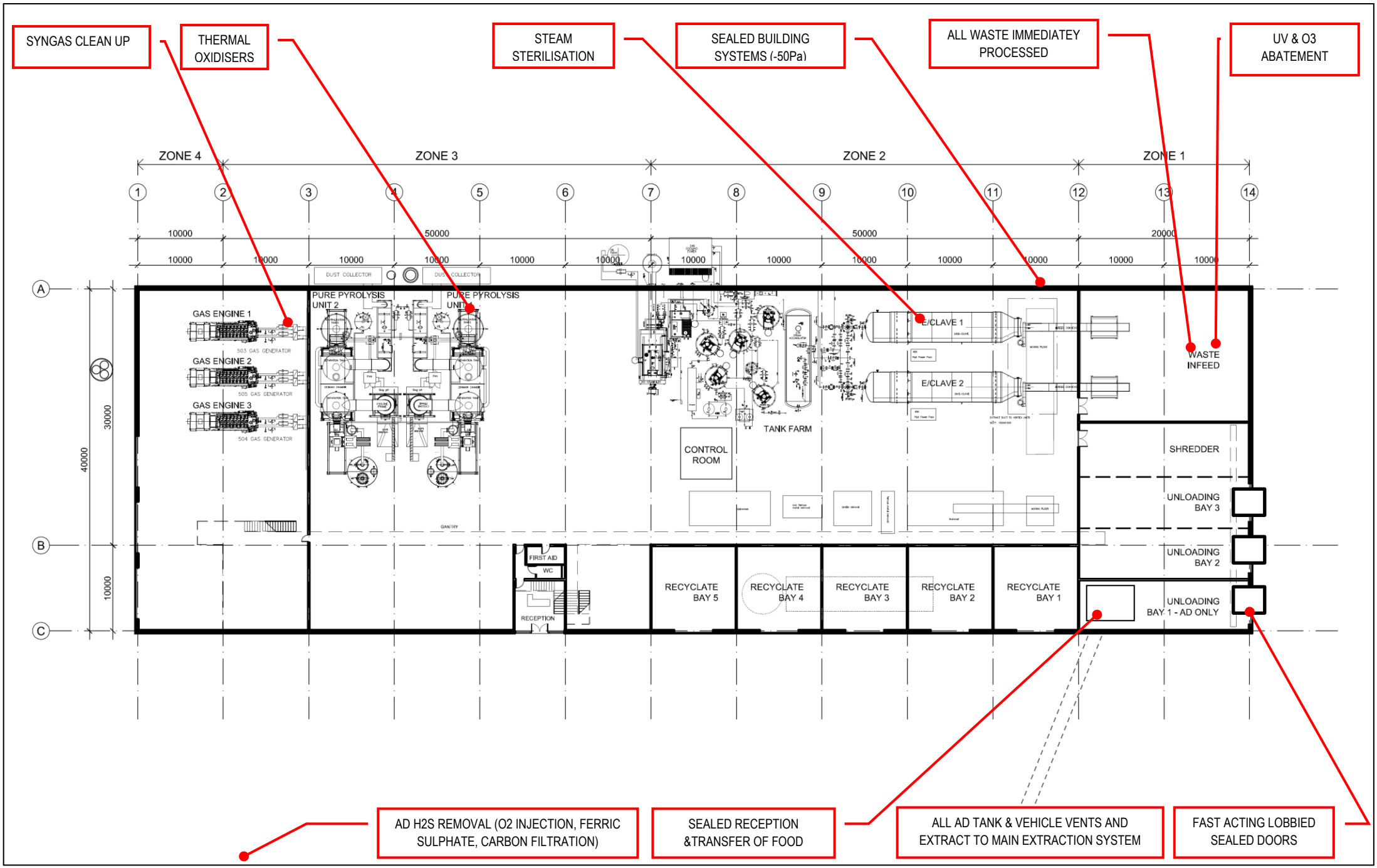

1. Do not scale off this drawing
2. All dimensions to be confirmed on site
3. This drawing is copyright of Sol Environment Ltd
4. This drawing is to be read in conjunction with relevant consultant drawings and specifications

Rev:	Date:	Desc:
0	JUN 13	Original

Client: CLEAN POWER PROPERTIES LTD
Job No: SOL0613CPP_01
Drawing No: OMP01
Revision: 0
Project: ODOUR MANAGEMENT PLAN
Drawing Title: ODOUR MANAGEMENT MEASURES
Drawn By: STEVE BUTLER
Scale: NTS
Date: JUNE 13

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The Solid Fuel Burner

The **Onix** Corporation is on the cutting edge of technology with its research on solid fuel. This research resulted in the development of The **ONIX** Series Solid Fuel Burners.

These burners operate primarily on reclaimed wood, bringing the fuel cost to a minimum. Depending on the availability of in-house waste such as poly tailings, sawdust, etc., consumers may experience a negative fuel cost.

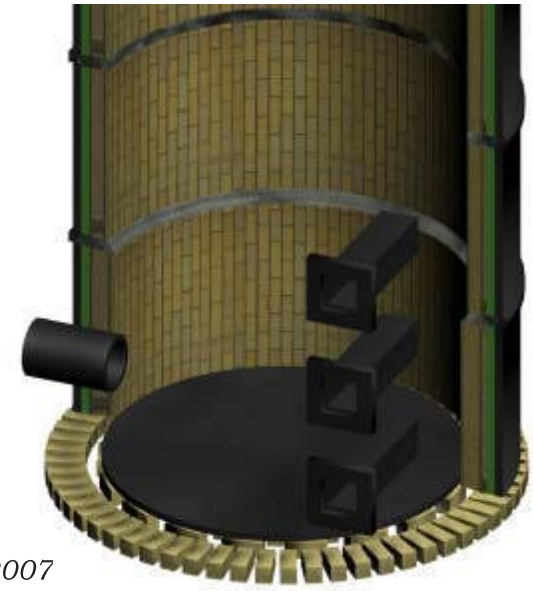
These burners are capable of delivering between 0.5 MM and 150 MM Btu's per hour and can achieve temperatures of 2,000 degrees Fahrenheit while saving money on every Btu used.

The **Onix** Corporation's **ONIX** Series solid fuel burners have many industrial applications including replacing outmoded burners, dryer heat source, heat for kilns, heat source for boilers, as well as winter space heating.

The **Onix** Corporation prides itself on meeting or exceeding local, state, and federal air quality standards. Our emissions contain virtually no sulfur, NOx, or CO.

20 MM Btu/hr solid fuel burner for a drying system. Drying system retains capability of using natural gas as a fuel.

There are over 100 **ONIX** Series solid fuel burners presently in operation world wide providing millions of Btu's for a fraction of previous fuel costs. These burners can be operated on a number of recovered co-products of manufacturing, which represent an additional expenses to a company currently discarding the co-products.



Cyclonic Combustion

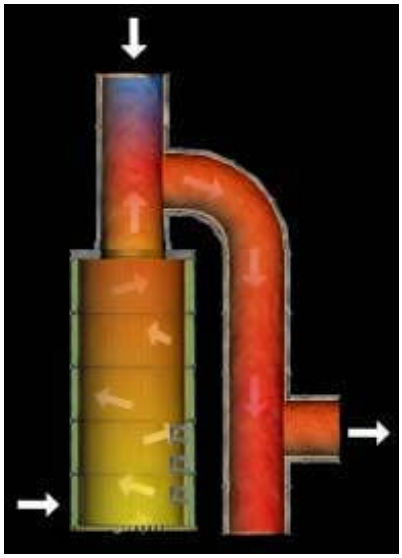
How it works

Cyclonic furnaces have become a major alternative to conventional burners. Applications include both large-scale utility boilers and certain industrial processes where waste heat can be recovered profitably.

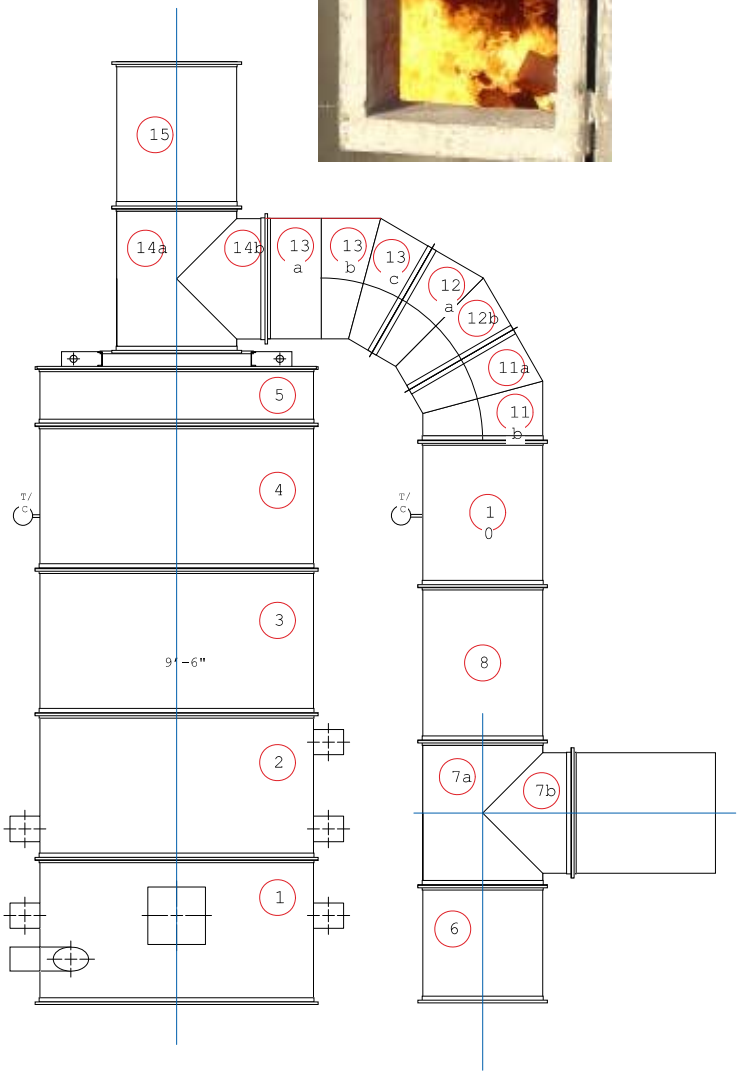
The **ONIX** Series solid fuel burner is operated by cyclonic combustion. In cyclonic combustion, the burning occurs at a positive pressure, rather than the slight negative pressure associated with most suspension fired wood systems.

The combustion occurs in a specially designed cylindrical reactor which discharges hot gaseous combustion products directly into the boiler or other vessels. Pulverized wood is blown into the cyclonic burner where it oxidizes immediately. Centrifugal action forces the particles toward the cylindrical wall of the burner where char oxidation occurs. Very high turbulence is generated in the cyclonic burner and char oxidation occurs within milliseconds.

Combustion intensity in cyclonic burners is considerably higher than combustion intensity in conventional wood suspension fired furnaces.



The vigor of the cyclonic action forces the wood particles to the burner wall, facilitating not only rapid combustion but also solid product removal. Cyclonic burners typically remove 99% of the solid products of combustion. These solid products of combustion exit the burner then enter the boiler or other vessels and are removed as fly ash by a particulate control system.



The Onix Corporation

ROTARY DRUM DRYERS • ALTERNATIVE FUEL SYSTEMS

SYSTEM FUNCTION

Cyclonic Solid Fuel Burner

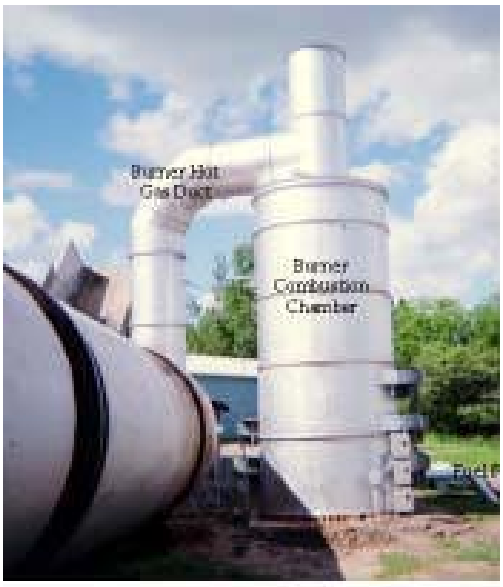
—-A Type "K" thermocouple at the dryer discharge senses an energy demand. Three things happen simultaneously :

1. Fuel feed rate increases.
2. The additional fuel creates an energy increase in the burner; this energy is drawn into the drum by the dryer i.d. fan.
3. The dryer outlet temperature is increased.

—-Wood fuel fires very clean in the burner. If burner emissions from the propane combustion or dried sawdust are exhausted directly from the combustion chamber to atmosphere, only heat waves are visible. There is no smoke, no malodor, and virtually no CO and VOC's. The combustion process is extremely hot and exceptionally clean.

—-Dried fuel is delivered to The **Onix** Corporation feeding equipment. This variable speed feeding equipment is capable of delivering material to the burner at continuous rates from 1 to 100 $ft.^3/hr.$

—-The entire system is automatic and basically labor free, with 100% automatic fuel feed to exact dryer needs.

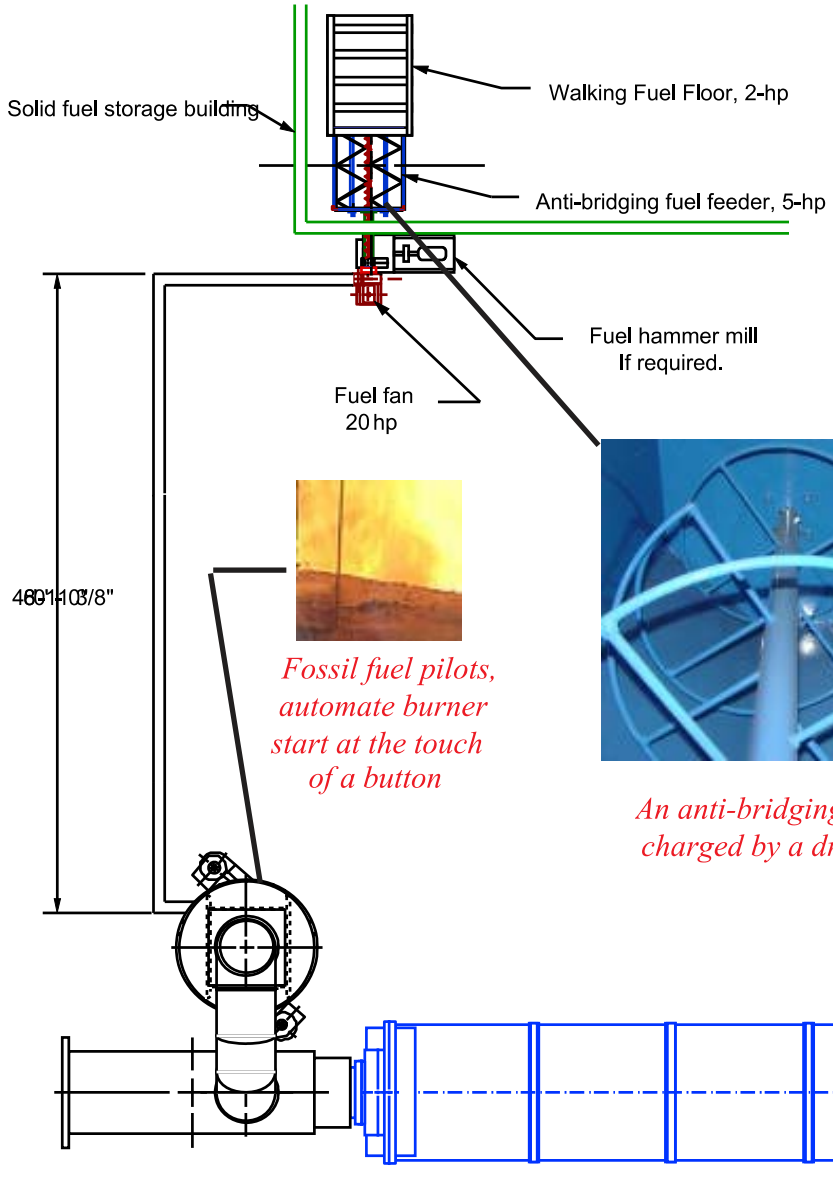


Onix – Fuel Delivery

All units are priced to include 4-hours of fuel storage through incorpora - tion of a top loading fuel deck. Tank feed systems can be substituted.

The Onix Corporation

26 MM Btu/hr Solid Fuel Burner
Typical Feeding Arrangement



Fossil fuel pilots, automate burner start at the touch of a button

An anti-bridging fuel feeder is automatically charged by a drag chain fuel deck holding 4-hours of fuel

Onix Installation

All units are priced to include installation within the continental US
(excluding fuel piping and motor wiring).
All pieces are pre-lined with refractory to speed up mechanical installation time to 1-day.

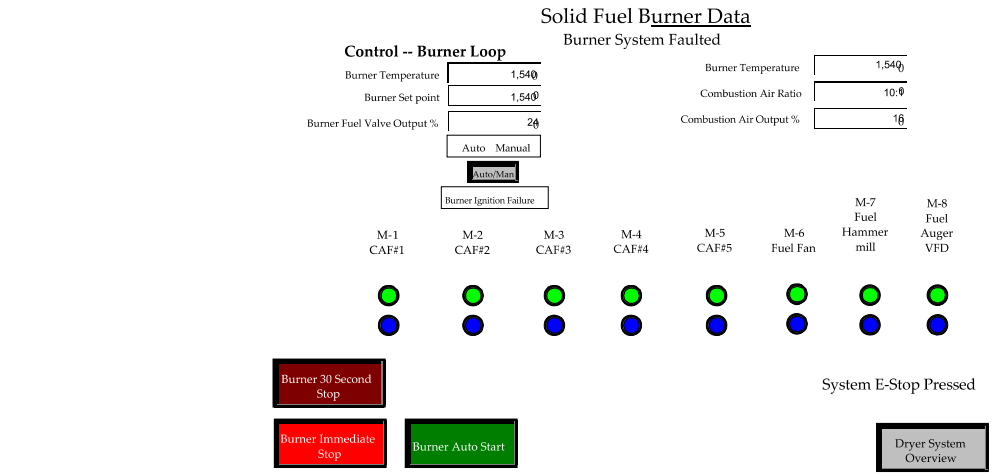
Onix Controls

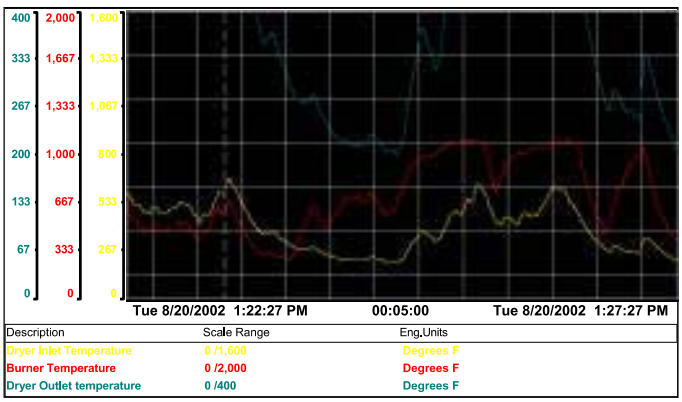
Control packages integrated with the Onix-OS©.

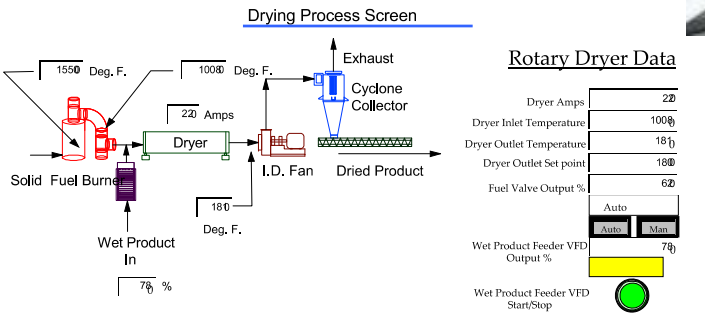
Real-time data displayed on a secure web page allows you to view your company's dryer data from your LAN or internet connection. Integrated security cameras will allow you to watch the dryer operation from afar.

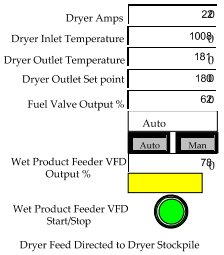
The Onix-OS©

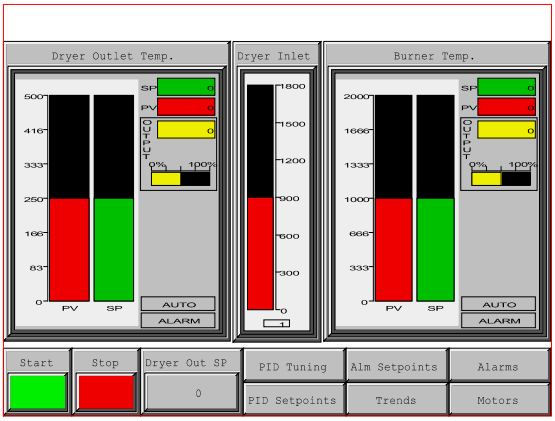
Solid Fuel Burner Overview Screen









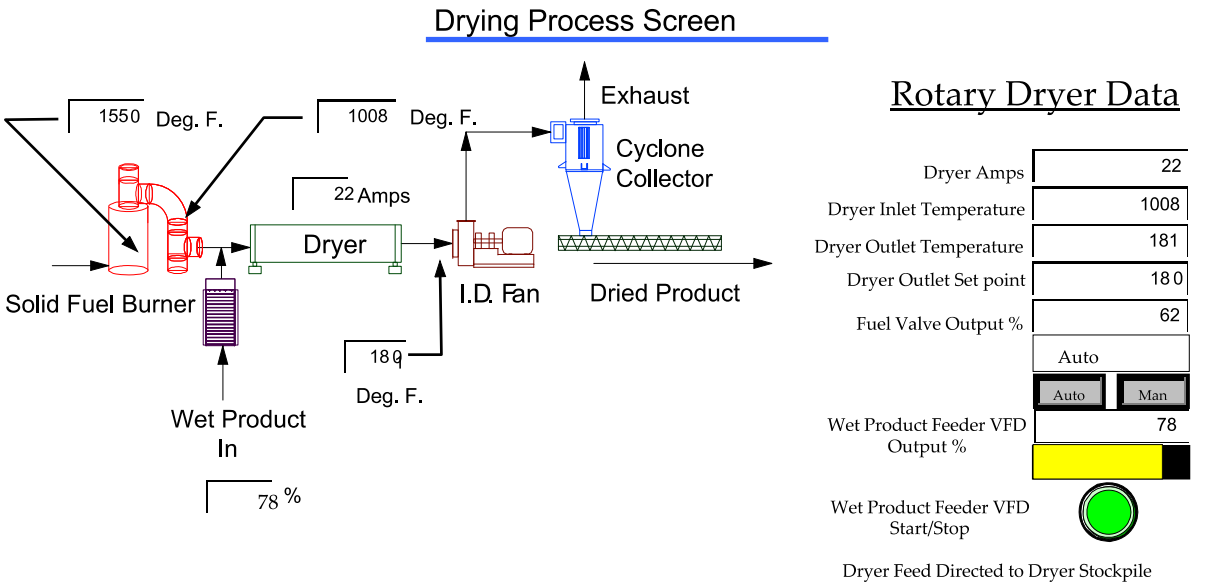


Onix OS©

The system features Allen Bradley/Entivity/Automation Direct Touch Screen controls. This degree of control allows for automatic and manual control. Controls will display fuel consumption in pounds per hour. The controls monitor dryer inlet and outlet temperatures and cause system safety shut-down in case of extremes. This level of automation offers burner trial for ignition at the touch of a button and a comprehensive operator 10" touch screen display for all dryer functions controlled. A networked PC will historically track burner and dryer temperatures and all operator settings. An alarm screen on the touch screen will track alarm history. A modem connected to the PLC/PC allows for remote adjustment and troubleshooting of the PLC/PC program via phone or internet. Technical support is only a few mouse clicks away. Future expansion of this program is possible to include all dryer functions.

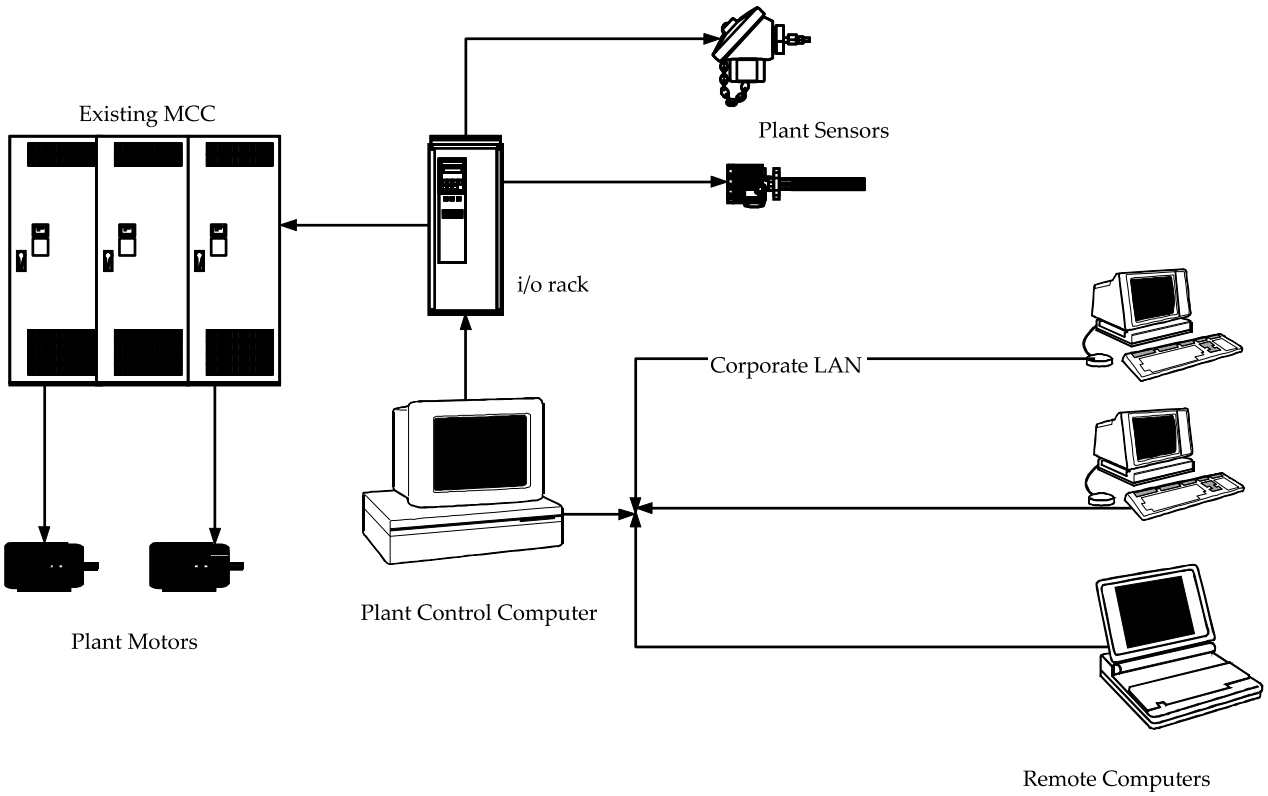
The graphic below presents an example of what the operator might see during system operation. The Onix-OS© also historically tracks dryer inlet, outlet and burner temperatures indefinitely. The Onix OS© can be upgraded to control all plant functions at anytime in the future or to display integrated existing values present, within the plant. The Onix-OS© can be remotely monitored or accessed via telephone or internet, which then permits interaction with control and trend screens.

Plant operators have a rugged 10" NEMA-4 touch screen interface to access all burner functions. Burner faults and alarms are tracked and recorded with a time and date stamp. This system integrates stopping of the wet product feeder and dryer i.d. fan in an ultimate high alarm condition.



Onix OS ©

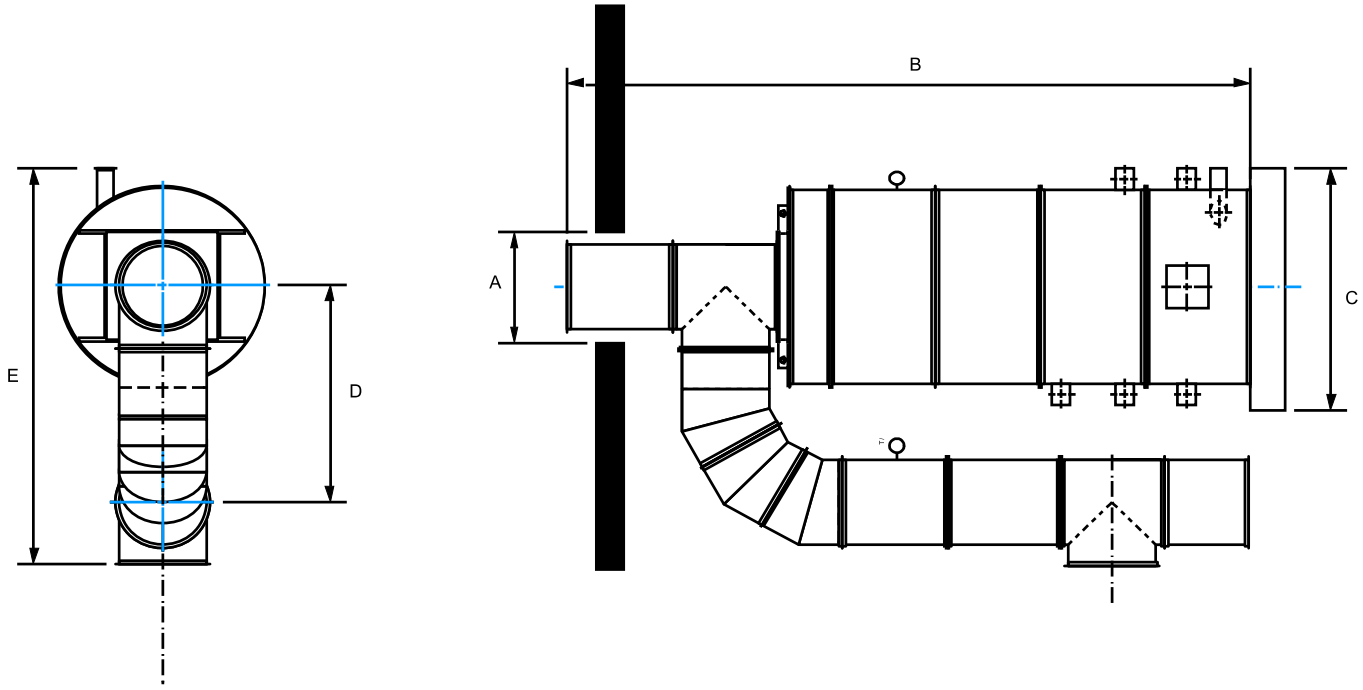
The Onix-OS© boasts up to 64 PID loops having, for all practical purposes, no limit to the number of burners or system components which it can control. This system has touch-screen control and is capable of automatically tracking historical trends and data archiving. The Onix-OS© can start and control all the motors at your plant, not just the dryer motors. The Onix-OS© allows authorized plant personnel to dial into the system to retrieve data on plant operation during the night, the past week or years back. It can track any parameter and inform when and why the system shuts down due to any alarm extreme. Reports can be generated to outline plant wide production during any selected time interval. The Onix-OS© can be modified to add motors or data items from a remote computer. This system will require the presence of an operator at start-up and



The Onix Corporation

ROTARY DRUM DRYERS • ALTERNATIVE FUEL SYSTEMS

Solid Fuel System Dimensions



Model Number	A	B	C	D	E	HP
ON-02	24	125	64	68	109	20 hp
ON-04	24	152	75	68	120	40 hp
ON-05	26	162	79	71	127	40 hp
ON-10	33	198	93	81	152	45 hp
ON-12	45	213	98	100	175	50 hp
ON-20	59	248	112	122	210	55 hp
ON-26	59	268	122	123	220	55 hp
ON-30	59	280	127	123	224	55 hp
ON-45	82	330	142	158	274	75 hp
ON-52	82	344	148	158	280	80 hp
ON-60	82	359	154	158	286	85 hp
ON-75	91	384	166	173	310	100 hp

All dimensions are in inches and are approximations contingent on approval drawing release
The number after the ON- indicates the burner maximum output in Millions of Btu/hr

P.O. Box 270_71Main Street--Caribou, ME 04736 * 800-844-0076 Phone * 207-496-3253 Intl. Phone -- 207-496-3743 FAX

The Onix Corporation

ROTARY DRUM DRYERS • ALTERNATIVE FUEL SYSTEMS

Model Number App. Horsepower		Maximum Energy Output
ON 02	20hp	**2 MM Btu/hr**
ON-04	40hp	**4 MM Btu/hr**
ON-05	40hp	**5 MM Btu/hr**
ON-10	45hp	**10 MM Btu/hr**
ON-12	50hp	**12 MM Btu/hr**
ON-20	55hp	**20 MM Btu/hr**
ON-26	55hp	**26 MM Btu/hr**
ON-30	55hp	**30 MM Btu/hr**
ON-45	75hp	**45 MM Btu/hr**
ON-52	85hp	**52 MM Btu/hr**
ON-60	90hp	**60 MM Btu/hr**
ON-75	100hp	**75 MM Btu/hr**

- Complete solid fuel burner packages included anti-bridging fuel feeder with 4 hours of fuel storage for top loading, tank feed system may be substituted.

- All solid fuel burners have customer choice of gas, propane or #2 fuel oil fossil fuel pilot

- All programs must undergo a thermodynamic analysis by The **Onix** Corporation to assure program viability and price.

- All system components have a three-year warranty full replacement.

- Horsepower requirements are approximations. Price includes a fuel hammer mill for on line size reduction for 1" maximum lump size.

- All systems include PLC/ PC for system control interface, data tracking and network wide control. Internet viewing of system is available with applicable internet connection.

- All prices are in U.S. Dollars

P.O. Box 270 • Caribou, ME 04736 Phone: 800-844-0076 207-496-3253 Intl. • Fax: 207-496-3743

A Breath of Fresh Air

Efficient

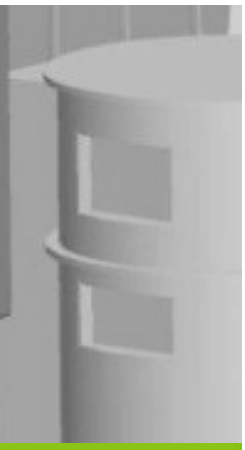
Economical

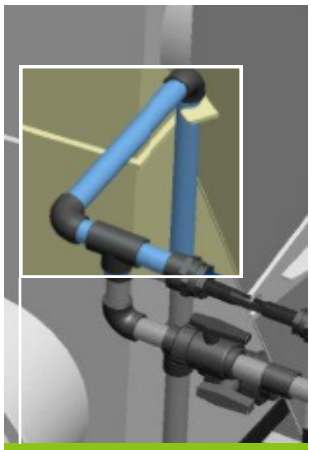
Compact

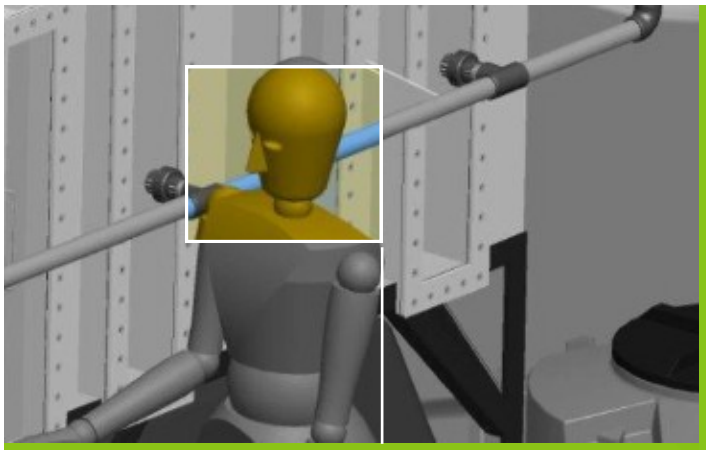
VTfiltration

Fluidized Bed Bio Filtration

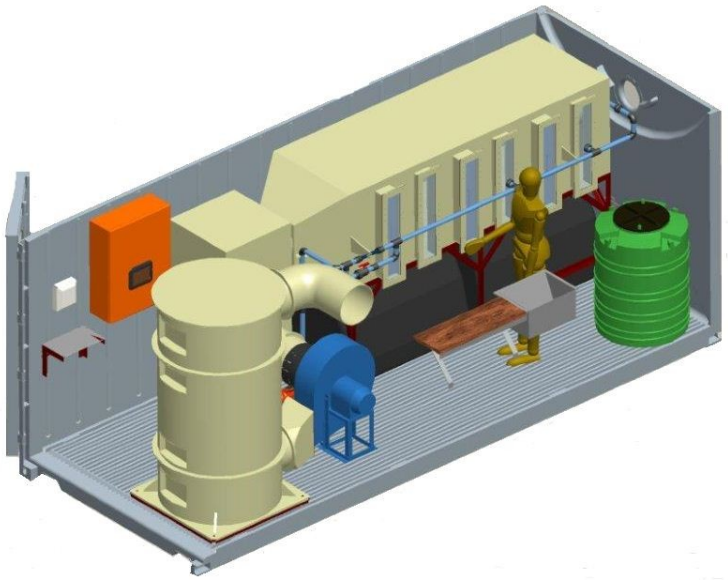
Ultimate **Odour** and **VOC** Control







www.VTfiltration.com



- 1/10 the size of Static Bio Filter
- Very Low Maintenance Cost
- Controlled Humidity - No Effluent
- Removes 99.60% of H2S
- Complies to Most Stringent Standards
- Self Regenerating Media
- Modular and Mobile
- Small Footprint With High Capacity

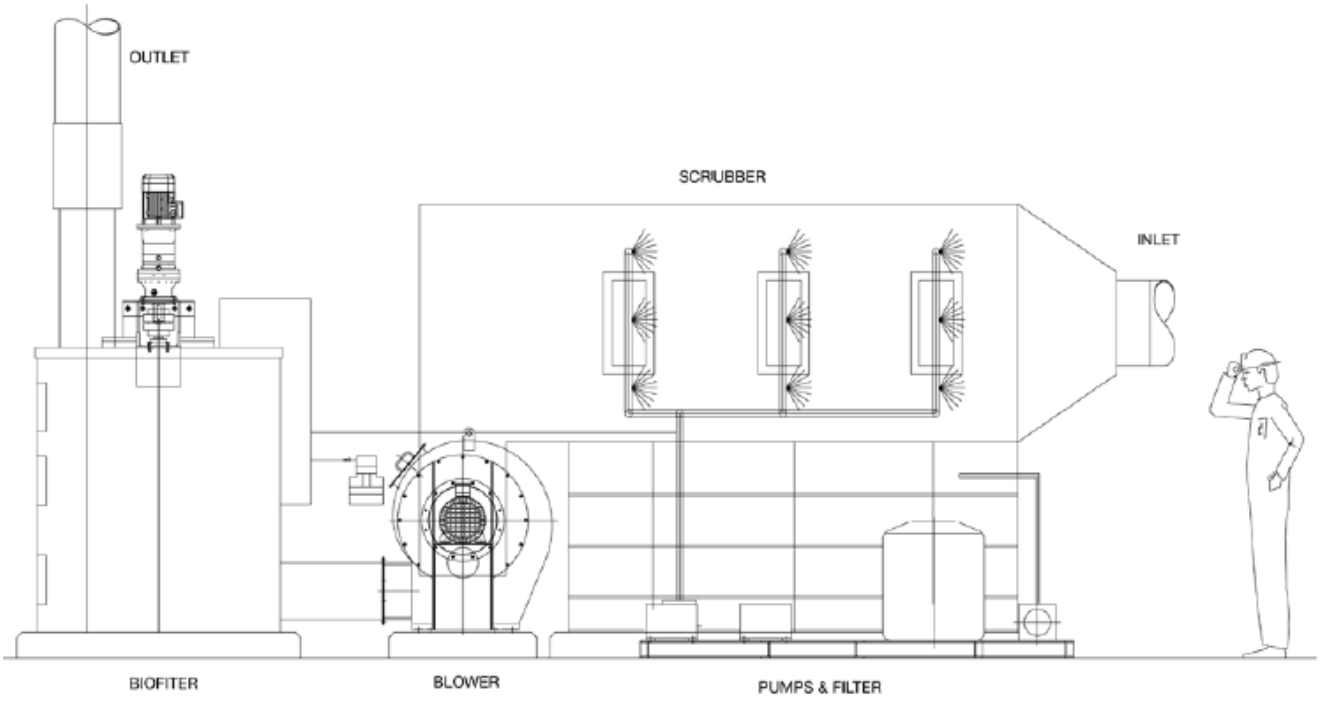
We say with confidence that this is the best Bio Filtration technology available on the Global Market today!

W Series

VTfiltration

A Breath of Fresh Air

Waste and Waste Water treatment - inconsistent air stream.



VT Filtration Systems' W-Series was developed for treating odours in typical wastewater applications where the main pollutant is hydrogen sulphide. Other pollutants, occurring in lower concentrations, which are also removed by the system include:

- Other Total Reduced Sulphur (TRS) compounds including mercaptans, dimethyl sulphide, dimethyl disulphide
- A variety of Volatile Organic Compounds (VOC's)
- Ammonia

The W- Series uses a two phase approach for the removal of pollutants:

Phase 1 – Ozone Scrubbing

- Soluble hydrogen sulphide (H2S) is absorbed into the scrubber brine.
- Ozone is used as the oxidant. It is generated from oxygen with no hazardous by products.
- Ozone is introduced into the solution where it oxidises the pollutants (H2S, SO2) to sulphates.

Phase 2 – Fluidised-bed Bio filter

- TRS compounds are removed (mercaptans >90%, sulphides >85% and any remaining hydrogen sulphide >99% or 0.1ppmv.
- VOC's are removed >90%
- Pollutants are oxidised by bacteria to form a harmless bio-sludge. The bio-sludge waste falls to the bottom of the filter and is drained away from the plant on a continuous basis.
- The media humidity is controlled to optimise phase transition of pollutants.

The W-series is the smallest and most cost effective system available for its application. This is mainly due to three factors:

1. We combine two processes into one system, thereby targeting specific pollutants more effectively.
2. Ozone scrubbing is a very efficient way of removing hydrogen sulphide from an air stream.
3. Our patented fluidised-bed bio filter has at least 20 times more active surface area per unit volume than the most efficient static bed bio filters.

W Series

Other advantages over using only bio filtration include:

Reduced start-up delays and downtime

- The scrubber is a purely chemical process, so there is no start-up period for removal of the main pollutant, hydrogen sulphide (>99%).

Replacement of the Bio filter media is not necessary.

- The media consists of inert PVC pellets, which provide a growing surface for the bacteria. It does not compact or decompose.
- There is no deterioration of the active biomass over time, because waste bio-sludge is removed from the media on a continuous basis.

Handles peaks and variations better

- The scrubber buffer solution absorbs the peaks and variations in the inlet hydrogen sulphide concentrations (up to 500ppmv).

Other sources of hydrogen sulphide where the W-series is effective include: petroleum refineries; unrefined petroleum product depots; natural gas plants; petrochemical plants; oil sands plants; pulp and paper plants that use the Kraft pulping process and stock feedlots.

Our 700m3/hr Evaluation Unit is available for trial installations. This is a fully functional 2 phase unit.

System Requirements:

Power Supply: 380V AC

Water Supply: 3/4" connection to potable or clear effluent supply (minimum 3 bar).

PH Stabilizer such as Lime/Caustic consumption: Varies between 0.3 to 1.5 litre/100,000m3 of air treated and is dependant on the hydrogen sulphide concentration.

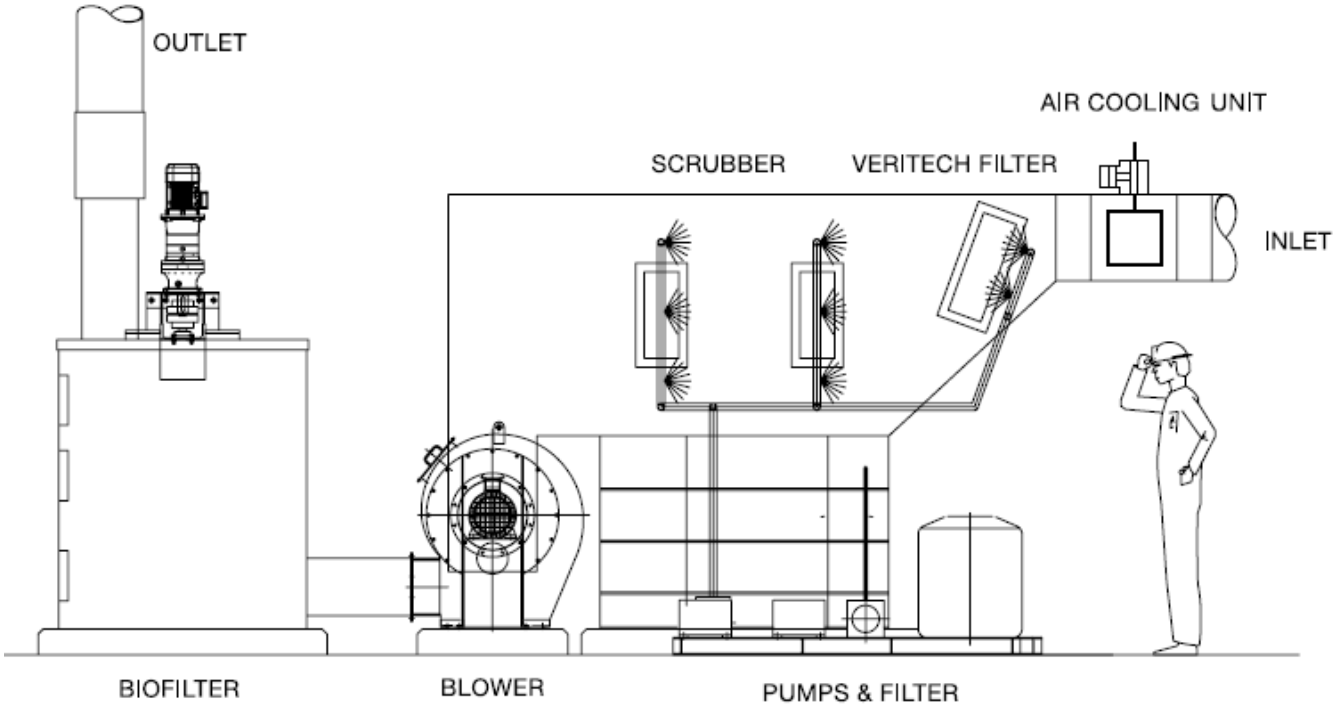
Wastewater drain: 110mm sewer connection or similar

Spatial:

Model	Capacity	Footprint	Height
VT3000W	3,000 m^3/hr	6 x 2.5 m	2.5 m
VT6000W	6,000 m^3/hr	6 x 2.5 m	2.5 m
VT15000W	15,000 m^3/hr	12 x 2.5m	2.5 m

R Series

Constant & Identified Air Stream - such as Rendering Plants



VT Filtration System's R-series was developed for treating odours from food waste rendering plant applications, typically comprising:

- Total Reduced Sulphur compounds (sulphides and mercaptans)
- VOC's including aldehydes, ethylamine, organic acids and PAH's
- High ammonia concentrations

Typically, these emissions must first be cleaned of fats and particulates before the cocktail of odorous compounds can be removed by a combination of wet scrubbing and bio filtration.

The R- series uses a three phase approach for the removal of these pollutants:

Phase 1 – Veritech Filter

• Fats and particulates are removed through mechanical filtration.

Phase 2 – Wet Scrubbing

• Soluble pollutants (mostly ammonia) are absorbed into the scrubber brine and oxidised to harmless by products.

Phase 3 - Biofiltration

- VOC's and TRS's are oxidised by bacteria to form a harmless bio-sludge. The bio-sludge waste falls to the bottom of the filter and is drained away from the plant on a continuous basis.
- The media's humidity is controlled to optimise phase transition of pollutants.

The R-series is the smallest and most cost effective system available for its application. This is mainly because we combine three processes into one system, thereby targeting specific pollutants more effectively:

1. Wet scrubbing is a very efficient

2. Our patented fluidised-bed bio filter has many times more active surface area per unit volume than the most efficient static bed bio filters.

3. Our patented Veritech filter is proven to be the most efficient fat filter available, thereby ensuring that the downstream processes are not clogged by fat.

A Breath of Fresh Air

R Series

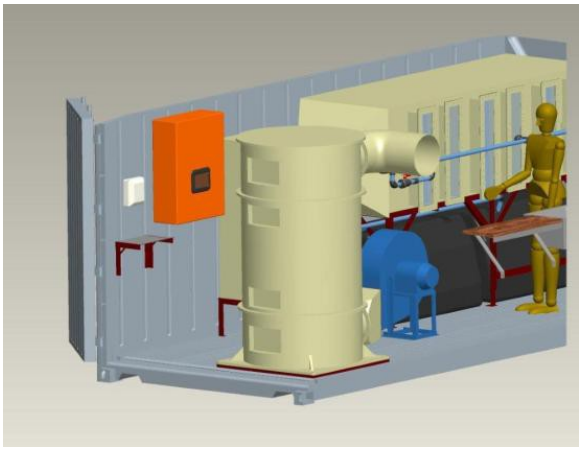
Other advantages include:

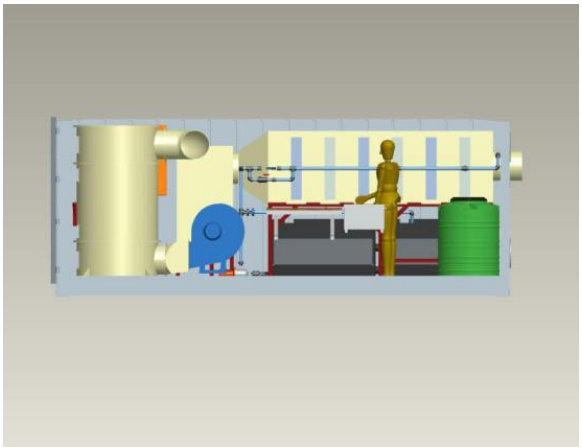
Replacement of the Bio filter media is not necessary.

- The media consists of inert PVC pellets, which provide a growing surface for the bacteria. It does not compact or decompose.
- There is no deterioration of the active biomass over time, because waste bio-sludge is removed from the media on a continuous basis.

Operational feedback and maintenance contracts are available.

- All operational parameters can be monitored via our website.
- We offer an operation and maintenance service on all of our systems.





Spatial:

Model	Capacity	Footprint	Height
VT3000R	3,000 m3/hr	6 x 2.5 m	2.5 m
VT6000R	6,000 m3/hr	6 x 2.5 m	2.5 m
VT15000R	15,000 m3/hr	12 x 2.5m	2.5 m

System Requirements:

Power Supply: 380V AC

Water Supply: 3/4" connection to potable or clear effluent supply (minimum 3 bar).

Sulphuric acid (H2SO4) consumption: Varies between 0.3 to 1.5 litre/100,000m3 of air treated and is dependant on the ammonia concentration.

Wastewater drain: 110mm sewer connection or similar

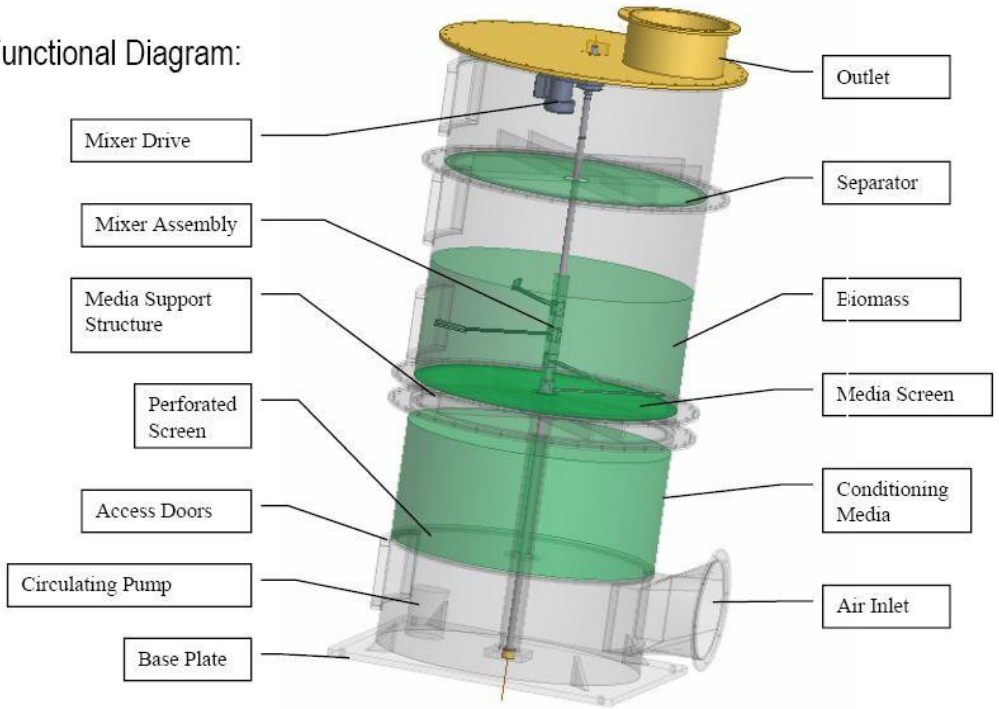
A Breath of Fresh Air

A Breath of Fresh Air

VTfiltration

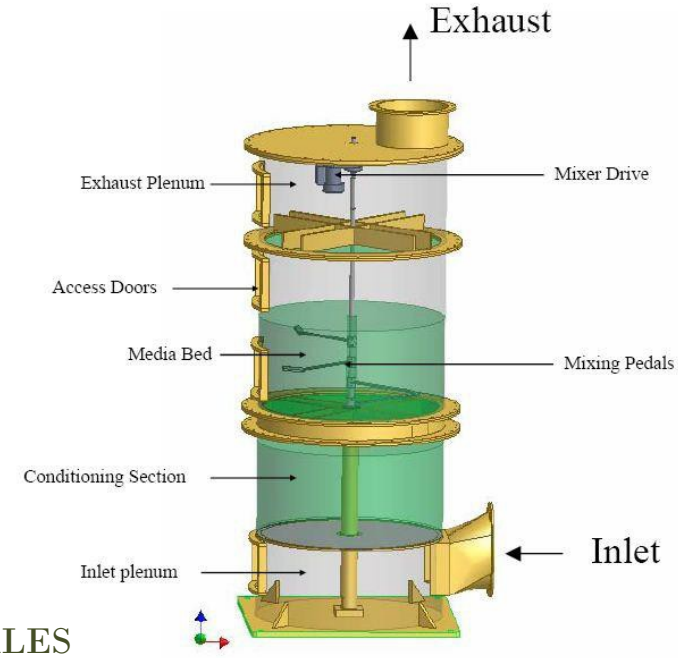
Process Diagram

- Functional Diagram:



How it Works

The contaminated air passes through the pre treatment section before entering the patented continuously agitated fluidised biomass where the rapid bio oxidation takes place. The cleaned gas stream then passes through a post filtration air polishing phase if required.



INTERMATIOAL SALES

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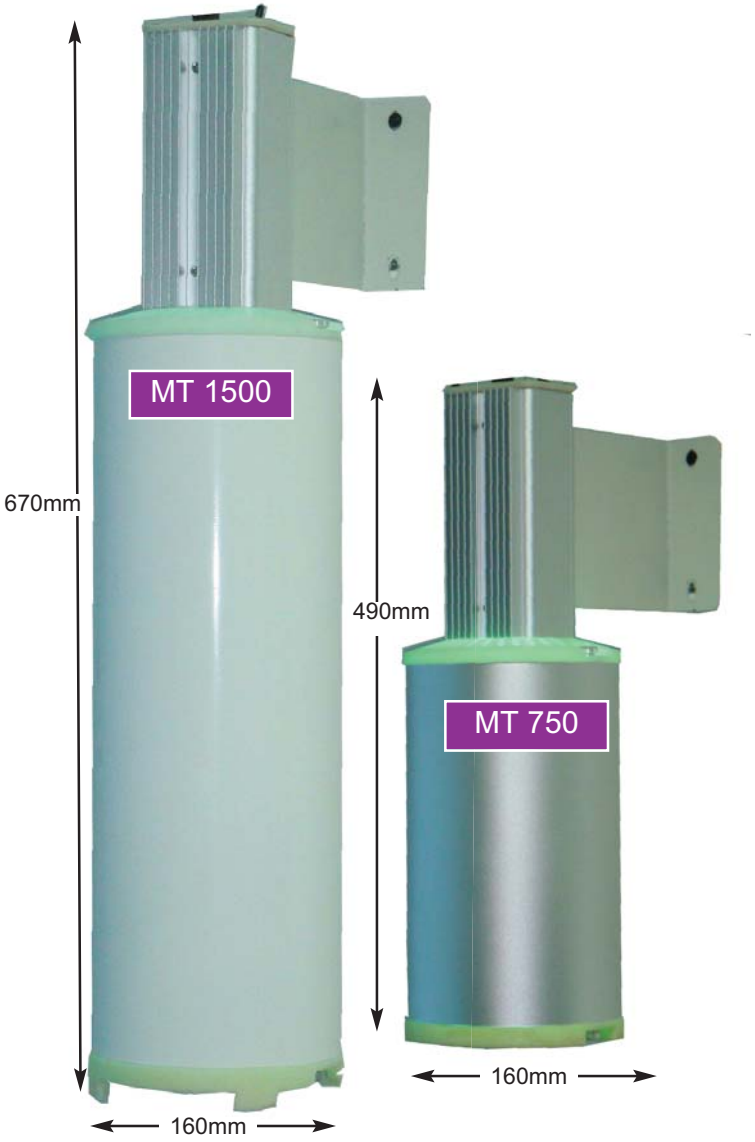
+44 (0)1204 384887

HEAD OFFICE

VeritechFiltration AG,
BernaPark,
Bernstasse 1, CH 3066,
Stettlen, Switzerland

If you could control odours while reducing costs why would you not do it?



HPA Porton Down labs proved that in one hour of continuous operation a standard Air Steril MP20 unit killed 98.11% of airborne contamination. The HPA concluded that these results demonstrated the effectiveness of the Air Steril technology.

Odours and infections are created by Bacteria, Viruses, Mould, Fungi and Volatile Organic Compounds (VOCs) found in the air and on surfaces.

Environmental Protection legislation makes it an offence to manage waste in a manner likely to cause harm to human health or the environment, including offence to the senses. Waste processing, sewerage, poultry plants, food manufacture, composting and many more industrial processes are all subject to odour control regulations

Cleaning, filtration and chemical dosing cannot control the source of the odours while masking odours with strong fragrances can only have a limiting effect. In just eight hours one bacteria can multiply to 8 million suggesting that continuous processes are required.

The Maxi Thermal 750 and 1500 offer 24/7 control of odour and infections in large enclosed spaces. The unique process uses the latest in thermal convection and U/V technology to kill up to 98% of pathogens in the air and on surfaces. Each unit offers coverage from 40m^2 to 70m^2 and a choice of lamp strengths to manage varying levels of contamination.

Hidden effects of Industrial Processing Bacteria and Viruses:

Unpleasant Odours

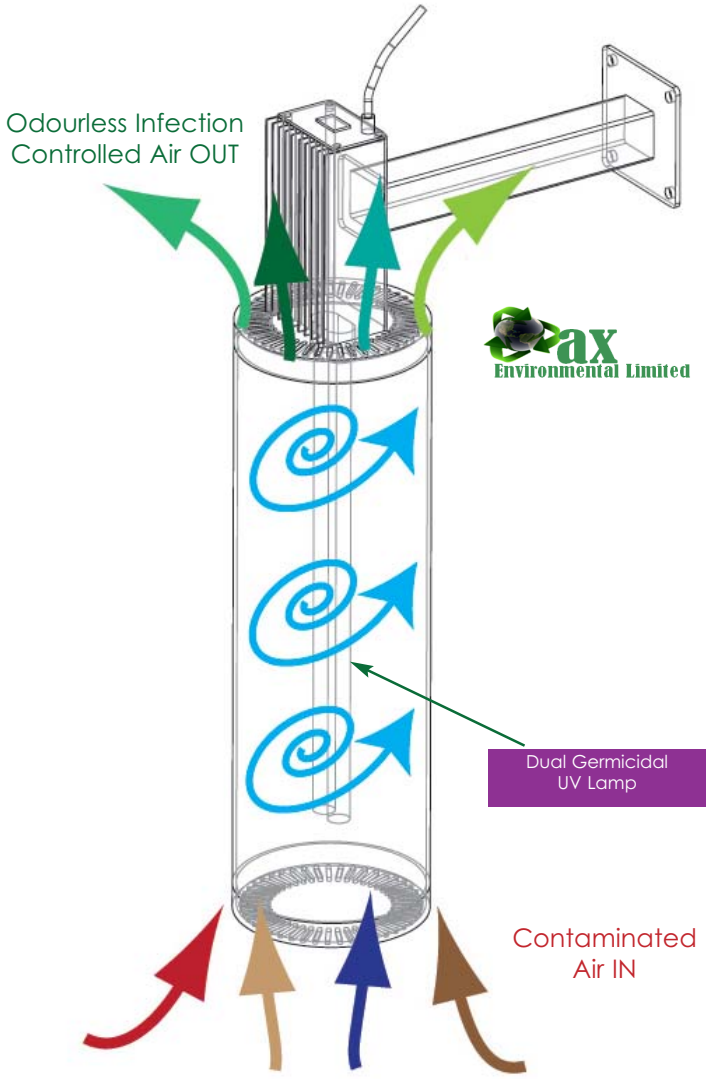
- Perceived poor hygiene and poor management
- Higher cleaning costs and premature refurbishment
- Non-compliance with legislation

Health Risks

- Kidney Infections, Common Cold, Influenza, Food Poisoning, Hepatitis
- Poor personal hygiene moves risk elsewhere
- Increased absenteeism and staff turnover

The Complete Air Purification Solution

Control Odours Eliminate Harmful Bacteria



How Does Air Steril Thermal Convection Work

The line drawing above shows the inner workings of an Air Steril Maxi Thermal unit

By unassisted thermal convection, the unit takes in contaminated air and purifies it using our unique dual lamp system. The dual ultraviolet light operates at the peak UVC wavelengths. One lamp makes ozone (O^3)and the other lamp coverts the ozone to hydroxyl radicals (OH) short-lived but powerful destroyers of the DNA of airborne pathogens

Specialist thermal convection smoothly moves air through the unit, and distribution of air over the dual lamp is controlled to increase exposure to the UV light providing maximum pathogen destruction both internally and around the internal space environment.

With a MT decontamination air purification unit from Air Steril you will

- Control odours 24/7
- Improve working environments
- Help staff healthcare
- Reduce chemical usage
- Reduce deodorants and perfumes
- Improve the image of your organisation
- Comply with legislation

Improving air quality in industrial processing plants will clear odours and improve the healthcare of your staff and visitors. The Air Steril Maxi Thermal 750 and 1500 eliminate unpleasant odours and controls harmful Bacteria and Viruses both in the air and on all exposed surfaces 24 hours a day, 365 days a year. Suitable for all enclosed spaces but not for use in areas of sedentary continuous occupation. With minimal maintenance and low consumption, they provide a green solution which improves the air quality and local environment for all users.

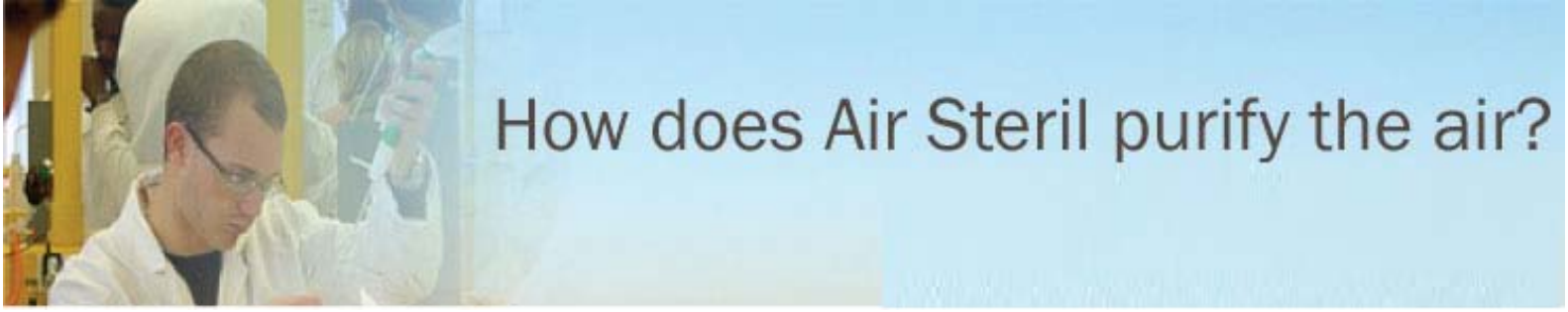
The advanced technology of the Maxi Thermal unit allows the control of Bacteria, Viruses and Moulds both in the air and on surfaces more efficiently than ever before. All of this is achieved without fans and with very low energy consumption The custom designed Thermal convection system ensures that contaminated air processed through the unit achieves optimum *dwell time* in the purifying chamber. As the processed air leaves the unit then in itself it becomes an efficient cleaning agent targeting pathogens both in the air and on surfaces.

The Maxi Thermal offers a unique design without the need of a fan motor or moving parts. All parts which could be affected by onerous off-gassing of caustic materials are encased an a hermetically sealed insulated chamber.

For more information call

01206 4 6000 4

Dax Environmental Ltd
1 weyland Drive, Stanway, Colchester, Essex, CO3 0RG
Tel 01206 4 6000 4 Fax 01206 548136 airsteril@dax-environmental.co.uk

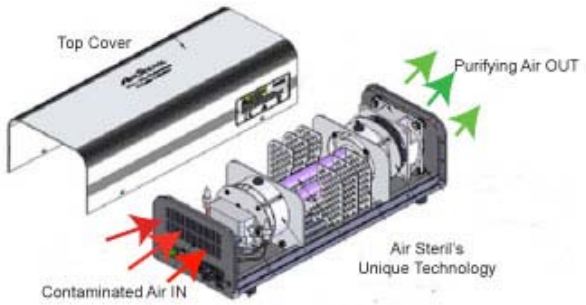


There are five independent mechanisms that Air Steril units use. Each mechanism can be individually controlled to create tailor-made solutions that meet specific purification applications and requirements.

The five technologies are:

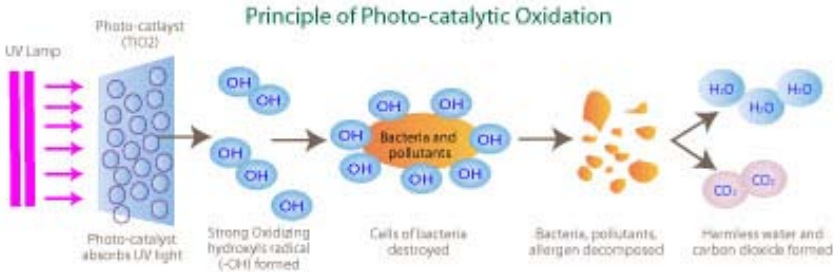
Internal
- Germicidal Irradiation (UV light)
- Heterogeneous Catalysis

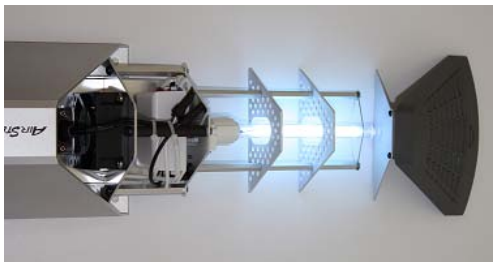
External
- Triatomic Oxygen Sterilization (Ozone)
- Plasma Quatro
- Super Oxide Ion Generation



Germicidal Irradiation (UV light) will kill micro-organisms as the air passes through the unit by disrupting the DNA of micro-organisms and preventing reproduction.

The Titanium Dioxide Plates inside the unit act as a Hetrogeneous Catalysis with the UV light to transform oxygen into a reactive state so it accepts a single electron, the molecule that gave up the electron is oxidised. The result is the production of Superoxide Ions. Part of this process also produces Hydroxyl Radicals which are one of the strongest oxidizers known, stronger than ozone.





The negatively charged Superoxide Ions work by electrically charging air contaminates as small as 0.01 microns and causing them to form clusters, thus assisting removal from the air and aiding the other processes.

Triatomic Oxygen (Ozone) is excited oxygen atoms produced via a catalyst in the lamp (Quartz). Triatomic Oxygen, will eliminate bacteria, viruses, fungi and VOC s in the air and on exposed surfaces as it leaves the unit with the air flow.

Plasma Quatro is the gas energized by the high intensity UV light, it leaves the unit with the airflow and consists of a mixture of activated oxygen, triatomic oxygen and superoxide ions. These interact with each other giving a very efficient purification of the air and all exposed surfaces. Many times more efficient than ozone or UV light working alone.

AIRsteril
infection & odour free environment

Overview

This procedure provides the necessary information to enable the assessment and off site transfer of non-conforming or untreatable waste streams.

1. Off site Waste Transfers

1.1 Typical materials that are likely to be transferred from the Wheldon site on a regular basis include (but are not limited to) the following:

Table 1: Table of Transferred Wastes

Waste Type	EWC Code	EWC Description	Site Management	Disposal Route
Ferrous metals	02 01 10, 12 01 01, 12 01 02, 15 01 04, 16 01 17, 17 04 05, 17 04 09*, 19 01 02, 19 10 01, 19 12 02, 20 01 40	Ferrous metal scrap	Stored in dedicated recyclate storage bay (on concrete hardstanding)	Transferred off-site for further processing and re-use
Non-Ferrous Metals	02 01 10, 15 01 04, 17 04 07, 20 01 40	Ferrous and non-ferrous metal (mixed) scrap	Stored in dedicated recyclate storage bay (on concrete hardstanding)	Transferred off-site for further processing and re-use
Plastics	02 01 04, 07 02 13, 12 01 05, 15 01 02, 16 01 19, 17 02 03, 17 02 04*, 19 12 04, 20 01 39	Mixed Plastics	Stored in dedicated recyclate storage bay (on concrete hardstanding)	Transferred off-site for further processing and re-use
Glass	20 01 02	Bottles - glass, Civic amenity waste, Containers - glass, Containers - glass (contaminated), Fibreglass, Glass, Glass bottles, Glass containers, Glass fibre, Glass pots, Vitreous enamels	Stored in dedicated recyclate storage bay (on concrete hardstanding)	Transferred off-site for further processing and re-use

Waste ash (char)	19 01 12	Combustion residue (MSW) - bottom ash	Stored in a segregated waste skip (on concrete hardstanding)	Transferred off-site for further processing and re-use
Mixed General Waste (office and general wastes) – Non Hazardous	19-12-12	Other wastes (including mixtures of materials)	Stored in segregated waste skip (on concrete hardstanding)	Transferred off site for disposal
Waste oils and greases (workshop and vehicle wastes)	13-02-05	Non Chlorinated Engine / Lubricating Oils	Stored in barrels / drums and stored internally within the maintenance area prior to off site transfer	Transferred off site for disposal
Off spec / non-compliant feedstock materials	Various	Various	Segregated / suitably contained within the main building and transferred off site through third parties.	Transferred to licensed treatment facility
Digestate (not deemed PAS 110 compliant)	19-06-06	Digestate from anaerobic treatment of animal and vegetable waste	Stored in digestate storage tank (enclosed with double membrane roof) on concrete hardstanding area	Transferred to exempted or licensed third parties for land/soil conditioning or fertilisation

All of the above materials are classified as wastes in accordance with The List of Wastes (LOW) Regulations 2005, which transpose the European Waste Catalogue (EWC) into domestic legislation, and provide codes for all hazardous and non-hazardous wastes.

Note that despite having a commercial value, biomass fuel feedstocks are classified as waste until they are recovered or reprocessed at their destination.

1.2 All wastes being transferred on site must be consigned to an appropriately qualified carrier. This is a legal requirement under the Environmental Protection Act S34 and of the Environmental Protection (Duty of Care Regulations) 1991.

1.3 Prior to the offsite transfer of any wastes to a third party a check should be made to ensure that the carrier is appropriately licensed. The link to the national database is provided below: (http://www2.environment-agency.gov.uk/epr/search.asp?id=EP8&&type=register)

1.4 Each consignment should be accompanied with an appropriately completed Waste Transfer Note. A template Waste Transfer Note is included in Annex A.

1.5 The following details will be recorded for each individual load transferred from on site:-

- Date and time of transfer of the load;
- Details and description of the vehicle accepting the waste, the driver's name, and the operator of the vehicle; and
- A description of the waste including type, EWC code and quantity

1.6 The Site Manager holds the responsibility for the correct description of all consigned wastes from site.

1.7 It is the responsibility of the weighbridge personnel to correctly log and record any waste transfers from site, ensure that the Carrier is appropriately licensed and that all relevant information is recorded.

1.8 All waste transfers should be recorded in the site diary by the Site Manager.

2. Training Record

The below signatories have received training and understand all aspects of procedure CPP-E04.

Table 2.1: Training

PRINT EMPLOYEE NAME	EMPLOYEE SIGNATURE	DATE	MANAGER INITIALS	UN-CONTROLLED COPY ISSUED (✓)

DATE: December 2013	**REVISION:** 1	**DOC #: CPP-SWP**

CLEAN POWER

PROPERTIES

SITE WORKING PLAN

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4. Site Infrastructure 13

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1. INTRODUCTION

1.1. Clean Power Properties Ltd existing site is located at Wheldon Road, Castleford (referred to hereafter as 'the installation'). The proposed development will comprise of an energy recovery centre comprising of an Advanced Conversion Technology plant and an Anaerobic Digestion plant.

1.2. The installation will receive non-hazardous mixed source waste and food waste from licensed and local authority permitted operators (See Section 2.3) and processes them to form the following primary products;

- Biofuel – biomass fuel produced during the autoclaving process and combusted in the pyrolysis units;
- Syngas – synthetic gas produced from combustion of the biofuel within the pyrolysis units, the syngas is then combusted within gas engines in order to produce renewable electricity and heat; and
- Recyclates – recovered during the autoclaving and mechanical separation process and shipped off-site for re-use.
- Biogas – biogas produced during the anaerobic process and combusted within gas engines in order to produce renewable electricity and heat;
- Solid Digestate – produced during anaerobic digestion and spread on neighbouring farmland as a fertiliser, the digestate shall be PAS 110 compliant[1]

1.3. This document forms the working plan and has been prepared in accordance with the following requirements:

- Environmental Permitting Regulations 2010; and
- Site Waste Management Licence / Environmental Permit *(EA Reference to be filled in once permit is issued)*.

1.4. This working plan has been prepared to provide an account of the operational practices and environmental considerations for the reception, handling and processing of mixed source waste ('MSW') and non-hazardous food waste and energy production processes carried out by Clean Power (UK) Ltd.

1.5. A sign which provides the necessary site and operations information is positioned at the entrance to the site. The sign provides all the necessary site information, contact details and relevant waste codes as required by the site Environmental Permit.

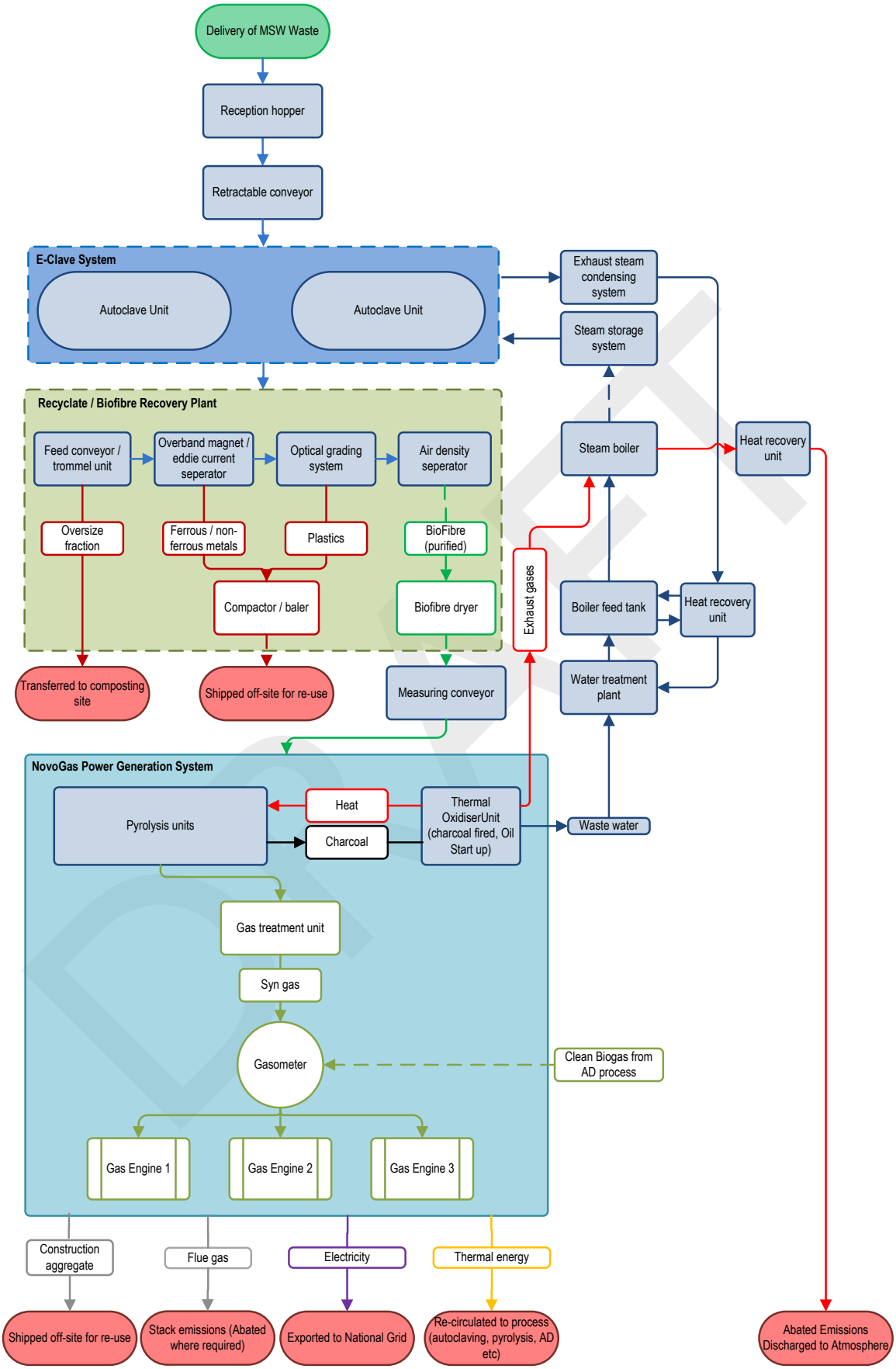
1.6. A copy of the Environmental Permit and the working plan will be kept in the site office at all times.

[1] PAS 110:2010 Specification for whole digestate, separated liquor and separated fibre derived from the anaerobic digestion of source-segregated biodegradable materials. Certification against PAS 110 allows all digestate produced on-site to meet EU 'End of Waste' criteria.

2. SITE PROCESS DESCRIPTION

2.1. Process Schematic

Figure 2.1 and Figure 2.2 provide a broad overview of the process flow through the facility. Further detail of each stage is provided within each of the specific working procedures in use at the sites and within the further sections of this working plan.


Delivery of MSW Waste
Reception hopper
Retractable conveyor
E-Clave System
Autoclave Unit
Autoclave Unit
Exhaust steam condensing system
Steam storage system
Recyclate / Biofibre Recovery Plant
Feed conveyor / trommel unit
Overband magnet / eddie current seperator
Optical grading system
Air density seperator
Oversize fraction
Ferrous / non-ferrous metals
Plastics
BioFibre (purified)
Compactor / baler
Biofibre dryer
Steam boiler
Heat recovery unit
Exhaust gases
Boiler feed tank
Heat recovery unit
Water treatment plant
Transferred to composting site
Shipped off-site for re-use
Measuring conveyor
NovoGas Power Generation System
Pyrolysis units
Heat
Charcoal
Thermal OxidiserUnit (charcoal fired, Oil Start up)
Waste water
Gas treatment unit
Syn gas
Gasometer
Clean Biogas from AD process
Gas Engine 1
Gas Engine 2
Gas Engine 3
Construction aggregate
Flue gas
Electricity
Thermal energy
Shipped off-site for re-use
Stack emissions (Abated where required)
Exported to National Grid
Re-circulated to process (autoclaving, pyrolysis, AD etc)
Abated Emissions Discharged to Atmosphere

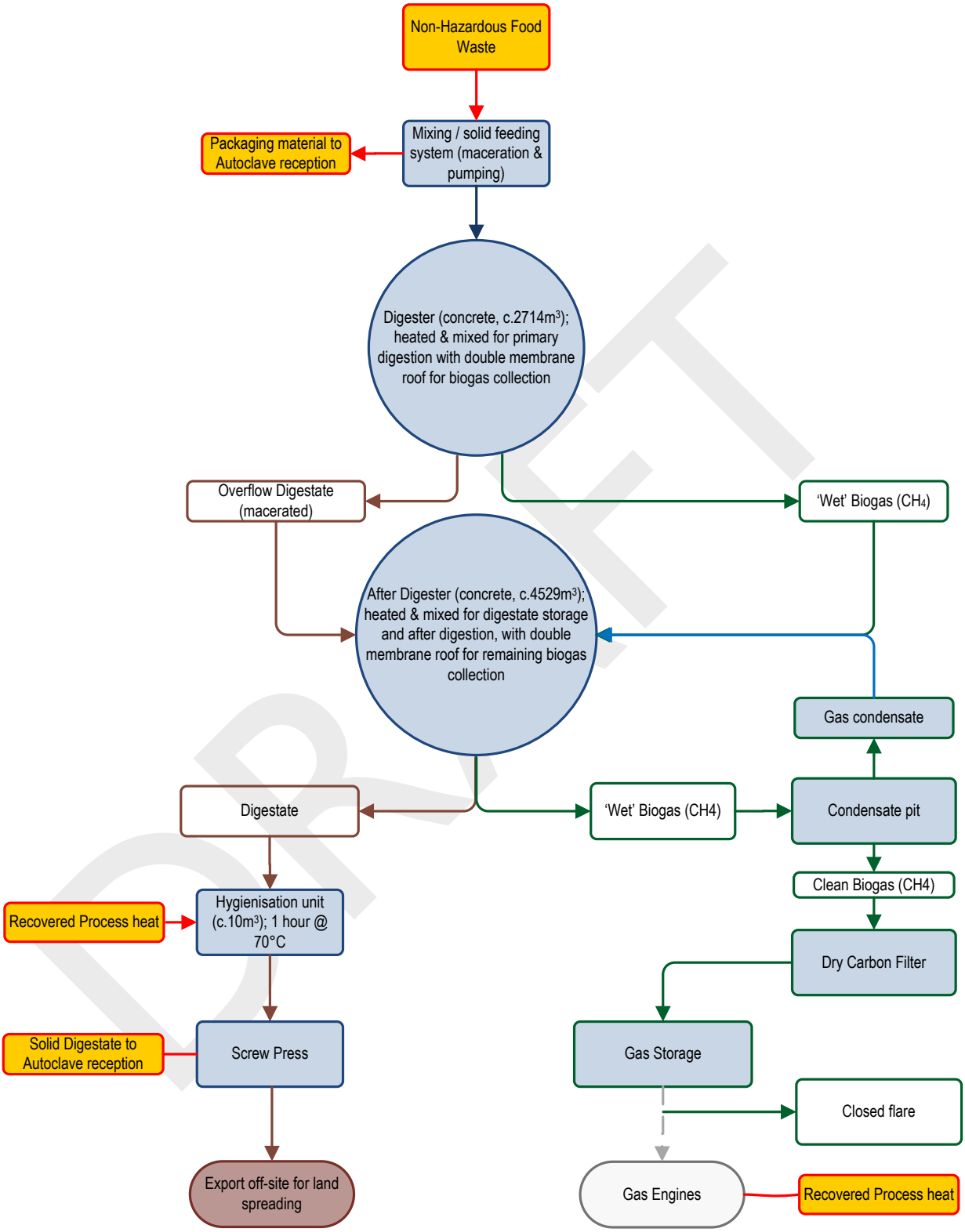


Fig 2.2: Anaerobic Digestion Process Schematic

2.2. Site Layout

The schematic below (Figure 2.3) provides an over view of the layout of the installation indicating the location of the key plant and equipment, plant and process areas.

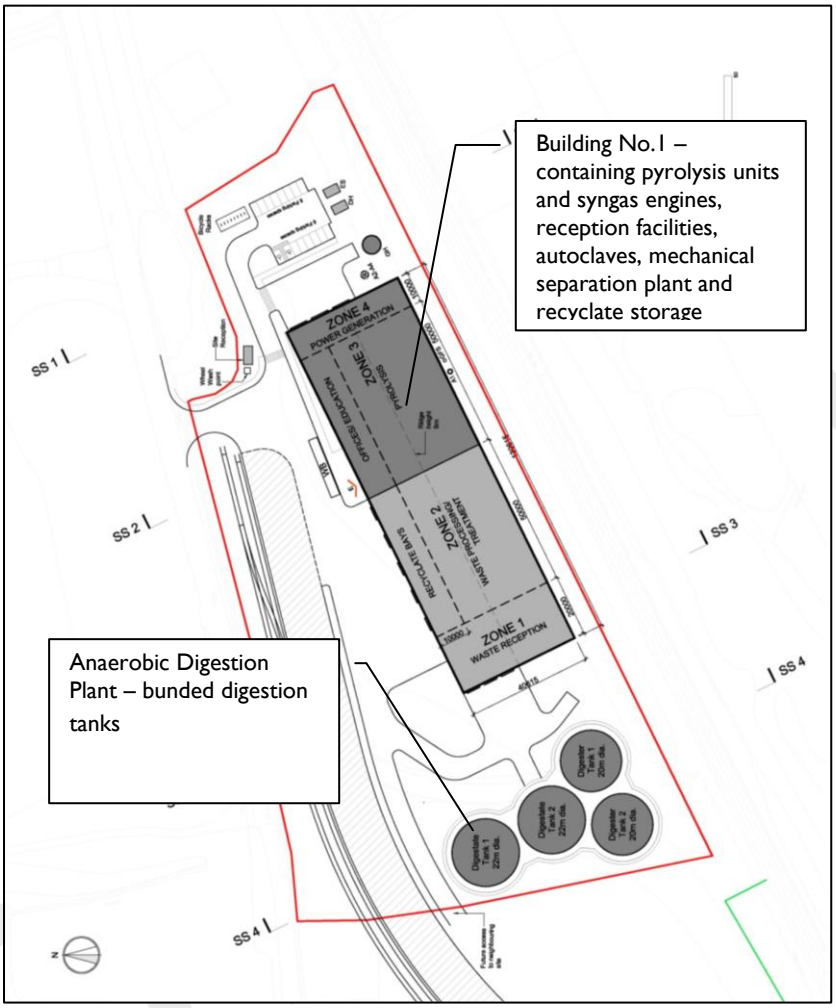


Figure 2.3 Site Layout showing process locations

The site covers an area of approximately 2.4ha.

2.3. Specified Waste Management Activities

The wastes accepted onto site comprise mixed source waste and green waste comprising the following waste types (and approximate proportions):

- Biomass / organic fraction (70%);
- Plastics (14%);
- Ferrous metals (6%);
- Non ferrous metals (3%);
- Textiles (2%);
- Glass (2%); and
- Other (2%).

Waste Management Operations can be represented diagrammatically in Figure 2.4 below according to Table 2.1 below.

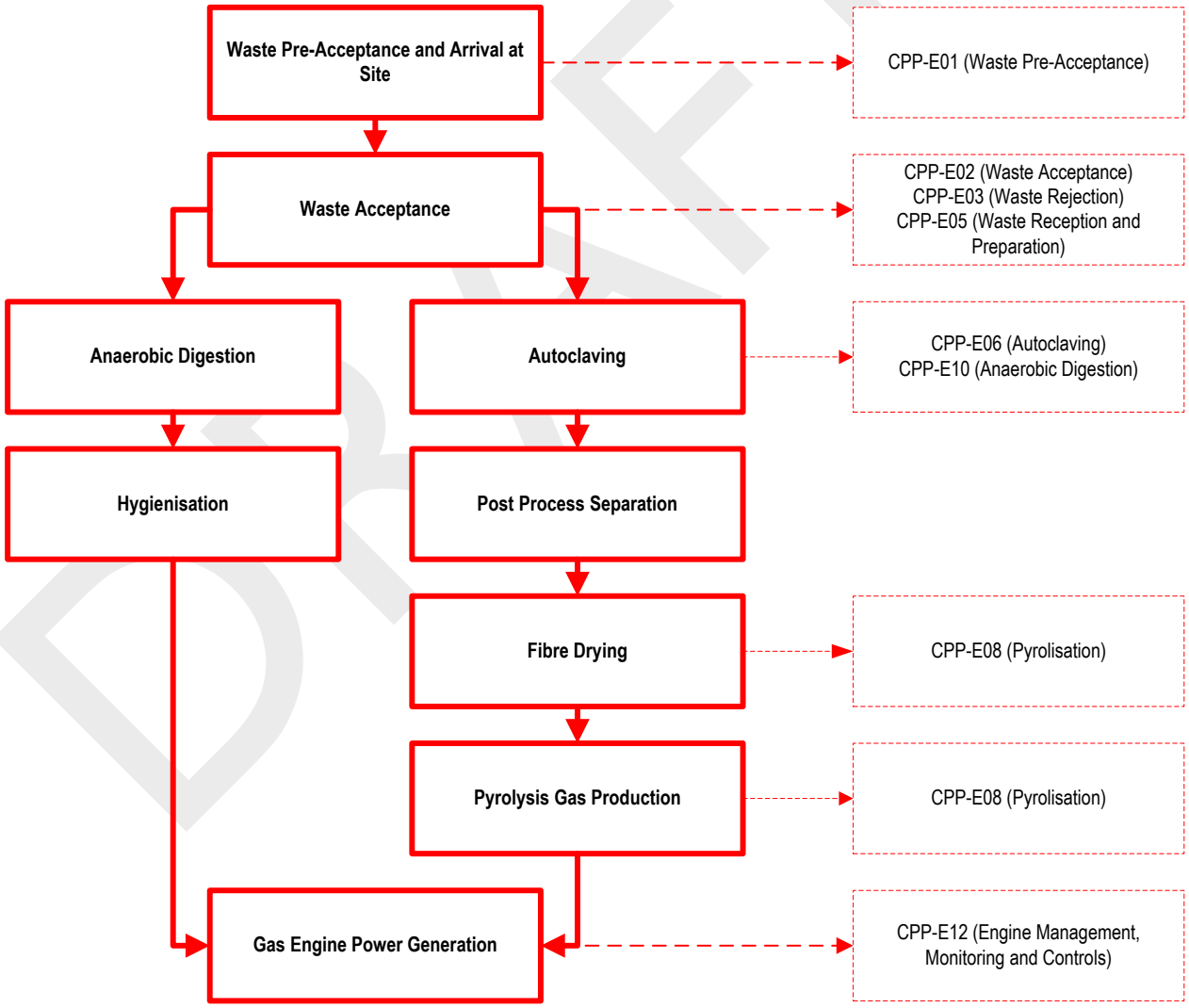


Figure 2.4 Site Layout showing process locations

Associated procedures for the above site processes are summarised within Table 2.1.

Table 2.1; SWP Procedure & Guidance Map		
Reference No:	**Title**	**Purpose**
CPP-E01	Waste Pre-Acceptance	This procedure defines the upstream screening, checking and pre-acceptance of all incoming waste prior to its arrival on site.
CPP-E02	Waste Acceptance	This procedure outlines the onsite controls and considerations that need to be applied when waste materials arrive on site for processing.
CPP-E03	Waste Rejection	This procedure outlines the waste rejection process for all non-conforming wastes that cannot be processed on site. Acceptance of non-conforming wastes will be a direct breach of the permitted conditions of the sites Environmental Permit.
CPP-E04	Off Site Waste Transfers	This procedure provides the necessary information to enable the assessment and off site transfer of non-conforming or untreatable waste streams.
CPP-E05	Waste Reception and Preparation	This procedure outlines the waste reception, storage and autoclave/anaerobic digestion loading processes for all incoming waste.
CPP-E06	Autoclaving	This procedure defines the processes and stages of the autoclaving processes
CPP-07	Recyclate management	This procedure defines the recyclate management and control process.
CPP-E08	Pyrolisation	This procedure defines the stages and control measures for the pyrolisation syngas generation process
CPP-E09	Slag and Ash management	This procedure defines the condensate management and control process.
CPP-E10	Anaerobic Digestion	This procedure defines the stages and control measures for the anaerobic digestion process
CPP-E11	Digestate Management	This procedure defines the digestate management and control process
CPP-E12	Engine management, Engineering and Controls	Procedure that outlines the required monitoring and analysis requirements for the operation of the gas engine generation sets, pasteurisation and digestion stages
CPP-E13	Environmental Records	This procedure defines the necessary Environmental Permit and Waste Records that are required to be managed by the site to ensure compliance.
CPP-E14	Environmental Monitoring and Management Programme	This procedure provides an overview of all of the necessary environmental monitoring, management procedures and controls to ensure compliance with the Site Environmental Permit.
CPP-E15	Infrastructure Monitoring and Cleaning Programme	This procedure provides an outline of the inspection and cleaning requirements for the site.
CPP-E16	Accident Management Plan	This procedures refers to the sites Emergency Plans and response requirements
CPP-E17	Odour Management Plan	This document outlines the sites Odour Management plan and requirements

Table 2.1; SWP Procedure & Guidance Map		
Reference No:	**Title**	**Purpose**
CPP-E18	Training	To ensure that all training needs are identified for a relevant personnel. In addition, educational and training qualifications and records are maintained
CPP-E19	Security	To ensure that all site and driver security controls are implemented and maintained to minimise security risks at Clean Power Properties.
CPP-E20	Emergency Procedures	To ensure the safe evacuation of the site and protection of the environment in the event of a site emergency.

The following associated procedures are appended to this document:

- CPP-E01 – Pre-acceptance;
- CPP-E02 – Waste Acceptance;
- CPP-E03 – Waste Rejection;
- CPP-E04 – Off Site Waste Transfer;
- CPP-E05 – Waste Reception;
- CPP-E06 – Autoclaving;
- CPP-E10 – Anaerobic Digestion

Incoming waste will be received in accordance as marked within Figures 2.1, 2.2 and 2.4 and within the individual site procedures. Waste material deemed suitable for autoclaving will be retained and processed as appropriate.

2.4. Waste processing

All waste arriving on-site will be processed through autoclaving, pyrolysis and anaerobic digestion activities, the key stages of which are summarised below (detailed process descriptions are contained within the relevant procedures highlighted in Table 2.1 and Figure 2.4):

- **Pre-acceptance / Acceptance:** Notification of consignment and inspection of waste deliveries in order to ensure compliance with site permitting requirements;

- **Preparation:** Preparation (automated loading into 'E-Clave' units) within the building shown as the 'Zone 1' in Figure 2.3;

  Zone 2 contains the inspection pit, 2 E-Claves (autoclave units), mechanical separation equipment, proprietary 'Biofibre' drying equipment and recyclate storage bays.

- **Autoclaving:** Steam treatment ('pressure cooking'), conditioning, reduction and sanitisation of waste. Reduction of waste volume by 80%.

- **Post-Treatment Separation:** Screening and mechanical separation of BioFibe from recyclates. Temporary storage of recyclates prior to re-use off-site.

- **Biomass Fibre Treatment and Pyrolysis:** Drying of Biomass Fibre within a proprietary unit and combustion within the pyrolysis units (within Zone 3) in order to produce synthetic gas ('syngas') which is temporarily stored within dedicated gasometers.

Zone 3 contains 4 pyrolysis units and 3 gas engines.

- **Anaerobic Digestion:** Four digestate tanks produce biogas which is combusted in the CHP plant and solid digestate which is reprocessed through the autoclave unit. Any liquid digestate produced is transported off site.

- **Power Generation by Gas Engine Generators:** Combustion of the syngas/biogas within specially-configured gas engines and subsequent production of electricity and thermal energy.

2.5. Site Management

All day to day management issues are the responsibility of the Site Manager, who holds the title of Competent Person, as defined by WAMITAB's and the Environment Agency's Operator Competence Scheme. Each treatment and storage vessel on-site is clearly labelled in correspondence with the processes described in this working plan.

3. Environmental Setting

3.1. Geology and Hydrogeology

According to the relevant British Geological Survey (BGS) Solid and Drift Geology Map of the area (Sheet 78: Wakefield) and the BGS Geology of Britain Viewer the site is directly underlain by the Pennine Middle Coal Measures Formation. The site is not underlain by superficial deposits.

The site is considered to be situated in an area moderate sensitivity with respect to groundwater resources due to the underlying Secondary A Aquifer. This sensitivity is mitigated somewhat by the absence of any groundwater abstractions within a 500m search radius of the Site and that the site is not situated in a groundwater source protection zone.

3.2. Surface Water Features

There are no surface water features located on site.

The nearest surface water body is the River Aire which is located approximately 450m to the west of the site at its closest point.

3.3. Sensitive Environmental Receptors

According to the EA website, the site does not lie within a Groundwater Source Protection Zone.

There are no groundwater abstraction licenses associated with the site. However, there are eight licensed groundwater abstractions recorded within 1km of the site. The closest of which is located approximately 660m to the south-west of the site which allows the abstraction of groundwater for general cooling and general usage.

There are no surface water abstraction licenses associated with the site. However, there are eight surface water abstractions within 1km of the site. The nearest of which is located approximately 411m to the north of the site and relates to the usage of water for dust suppressions.

There are no Special Areas of Conservation, Special Protection Areas or Ramsar Sites within 10km of the subject site. However, approximately 500m to the north of the site is the Fairburn and Newton Ings SSSI/LNR.

Based on the above, the installation is not likely to have any significant environmental effects due to the limited nature of emissions and the number of potentially sensitive receptors within the proximity of the installation.

4. SITE INFRASTRUCTURE

4.1. Building Design and Layout

The Waste Management and Energy Generation facility incorporates the construction of a new building to accommodate the Energy Recovery Centre.

The main building will comprise a single impermeable technically engineered portal framed structure 130m by 40m, at a height of 9m (to the ridge).

The building will be constructed with a proprietary curtain wall cladding system designed to ensure adequate air-tightness, acoustic and thermal performance.

The main building will house approximately 400m2 of internal offices, meeting rooms and visitor education areas.

All aspects of the internal office areas have been designed to ensure complaint access in accordance to the requirements of the Disability and the Equality Act 2010 (DDA)2.

The building will be subdivided internally to house the separate processes and be zoned to comply with relevant industrial safety regulation i.e. gas safety regulations, explosive atmospheres etc.

The south facing elevation of the main building roof will incorporate approximately 250m2 of solar photovoltaic panels.

There will be a stack associated with the pyrolysis plant, which will be approximately 25m in height and a maximum of 250m in diameter.

Each engine will have a single exhaust stack 100cm in diameter which exits through the building to a height of 25m, all grouped together to appear as a single exhaust stack.

The building will comprise of four dedicated zones, namely Zone 1 (Waste Reception), Zone 2 (Waste Processing/Treatment), Zone 3 (Pyrolysis) and Zone 4 (Power Generation) and contains the following equipment:

- Inspection pits and automated hoppers / in-feed conveyors for the loading of waste into the E-claves;
- Two (2) E-Clave units and an ancillary steam boiler system for the steam treatment of incoming waste;
- Mechanical separation equipment (including a trammel unit, overband magnet / eddie current separator, optical grading system, and a baler / compactor) for the post-treatment separation of recyclates;
- Water treatment and steam storage system (including a boiler feed tank, carbon filters, a steam accumulator, condensing system, heat recovery unit and external cooling towers) for the storage and provision of recovered steam to the E-Clave units;
- Biofibre dryer and air density separator for the pre-treatment of Biomass Fibre prior to pyrolysis in Zone 3).
- Four pyrolysis units (and associated vortex heating units) for the production of syngas from combustion of Biomass Fibre;

[2] From 1 October 2010, the Equality Act replaced most of the Disability Discrimination Act (DDA). However, the Disability Equality Duty in the DDA continues to apply.

- Three cogeneration (CHP) units (each with a 4MWe output) for the combustion of syngas produced from the pyrolysis process and subsequent production of electricity and heat; and
- One external thermal oxidiser unit (and associated exhaust stack, 25m in height) for the abatement of emissions from the pyrolysis.
- Each engine is equipped with its own stack.

All operational plant within the building will be checked weekly by the Site Manager as part of a planned preventive maintenance programme.

A number of ancillary structures will be located adjacent to the waste reception and pyrolysis building, including; a small gasometer (c. 6m (d) x 9m (h)), a cooling plant and a static pressurised nitrogen cyclinder.

Two small buildings of approximately 5m by 3m at a height of 3m will house the electricity sub-station and district heating connection and metering equipment serving the facility.

A small security/gatehouse building will be located adjacent to the site access and exit.

The site will also be fitted with 2 x AD digester tanks (25m dia) and 2 x AD disgestate tanks (30m dia). The tanks are fitted externally and extend to a height of 9.5m.

4.2. Drainage System

4.2.1. Contaminated Surface Water Runoff

The drainage system for internal and external areas is inspected weekly and maintained. All areas are hard-surfaced and surface water run-off is contained and discharged to holding tanks.

The site manager is responsible for the organisation of the cleaning of all building gutters, gullies, drains and storage tanks at appropriate intervals.

4.2.2. Uncontaminated Surface Water / Roof water Runoff

Clean precipitation runoff from the roof building units will be collected and directed to controlled waters.

4.3. Site Security

The relevant security measures will include;

- A perimeter fence which is inspected periodically to ensure that the site security has not been compromised.

- A gatehouse controlling the sole access point to the installation. This gatehouse will be manned from 0800hrs until 1800hrs during site operation and which is alarmed and monitored between 18:00 – 08:00hrs.

- CCTV monitoring of the external and internal areas of the Installation.
- External on-line monitoring and administration of the waste-to-energy process from a remote location.
- Heavy duty roller shutter doors for overnight site security.
- All personnel and vehicles entering the site are strictly controlled and managed; no vehicles or personnel will be allowed access to the facility without prior authorisation.

A copy of the site security plan will be stored at the Gatehouse.

4.4. Infrastructure Monitoring

The infrastructure monitoring of the site will take place in accordance with procedure CPP-E15 Infrastructure Monitoring and Cleaning Programme.

5. TECHNICAL COMPETENCE & TRAINING

The Manager is defined as the Technically Competent Person for the site. The site manager holds all necessary qualifications to be defined as 'Technically Competent' as defined by the Environment Agency Operator Competence Scheme and WAMITAB Certificate of Technical Competence Schemes.

All personnel on site have been trained in the site operation procedures and Working Plan according to table 5.1 below.

The site manager is responsible for insuring that all operators and personnel receive training as required.

Table 5.1; Training Summary

	Site Working Plan Manual CPP-SWP	Waste Pre Acceptance CPP-E01	Waste Acceptance CPP-E02	Waste Rejection CPP-E03	Off site Waste Transfers CPP-E04	Waste Reception and Preparation CPP-E05	Autoclaving CPP-E06	Recyclate Management CPP-E07	Pyrolisation CPP-E08	Slag and Ash Management CPP-E09	Anaeorbic Digestion CPP-E10	Digestate Management CPP-E11	Engine Management & Controls CPP-E12	Environmental Records CPP-E13	Environmental Monitoring CPP-E14	Infrastructure Monitoring CPP-E15	Accident Management Pland CPP-E016	Odour Management Plan CPP-E17	Training CPP-E18	Security CPP-E19	Emergency Response Plan CPP-E020
Site Manager	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Weighbridge Personnel	■	■	■	■	■																■
Administration Personnel	■	■																			■
Machine Operators	■		■	■																	■
Hand Sorters / Pickers	■			■																	■
Site Management	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Visitors																					■

Appendix 1

Operating Procedures

VERSION CONTROL RECORD			
Contract/Proposal Number:		**SOL1213CPP09_AB**	
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1 INTRODUCTION

This document has been prepared by Sol Environment Ltd on the behalf of Clean Power (UK) Ltd (hereafter referred to as "the applicant") in support of a Bespoke Installation Permit Application for the proposed operation of Clean Power Properties waste to energy plant utilising Advanced Conversion Technologies (ACT), pyrolysis and anaerobic digestion at Wheldon Road, Castleford.

This document represents the Accident Management Plan (AMP) submitted as part of the Application package to the Environment Agency (EA) (Sol Environment Ref. SOL1213CPP09_AB).

Clean Power (UK) Ltd site (*'the Site')* is located at Wheldon Road, Wheldon, Castleford, WF10 4SX.

The proposed process will incorporate ACT technologies, pyrolysis with and associated upstream processing and anaerobic digestion for the generation of renewable energy. The proposed development is a bespoke energy recovery centre that has been designed to recover all available resources from mixed solid waste feedstocks. The proposed development integrates the above technologies to provide a single treatment facility for solid wastes that would otherwise be destined for landfill or incineration.

The treatment process will be permitted by the Environment Agency as a Waste Recovery Operation and be operated in accordance with the EPR 2010 Regulations.

This Accident Management Plan has been produced in accordance with EA guidance Document *'How to comply with your Environmental Permit (EPR 1.00)'*.

It is stipulated under this guidance document that the Accident Management Plan fulfils the following four key requirements:

- Identifies events or failures that could damage the environment;
- Assesses how likely they are to happen and the potential environmental consequences;
- Actions to minimise the potential causes and consequences of accidents; and
- The actions that are required to be carried out if an accident happens.

This Accident Management Plan will be implemented and maintained at the site as part of the company's Environmental Management System and will ensure the site and all operatives within are fully prepared for such incidents.

A number of the control measures cited within this document refer the operators proposed suite of Environmental Procedures and new procedures which have been drafted in response to the proposed new operations at site (CPP-E01 to CPP-E20).

These documents should be referred to for detailed actions in relation to emergency response and control.

- CPP-E01 Waste Pre-Acceptance;
- CPP-E02 Waste Acceptance;
- CPP-E03 Waste Rejection;
- CPP-E04 Off Site Waste Transfer;
- CPP-E05 Waste Reception & Preparation;

- CPP-E06 Autoclaving;
- CPP-E10 Anaerobic Digestion;

The Accident Management Plan and all associated procedures will be reviewed at least every four years or as soon as practicable after an incident, with changes made accordingly to minimise the risk of occurrence / recurrence.

All of the necessary actions that are required to be taken in the event of an accident are detailed within CPP-E20 Emergency Procedure.

2 RISK MAGNITUDE ESTIMATIONS

The Accident Management Plan (Table 2.2 overleaf) has adopted a risk assessment approach to each potential hazard by combining the probability and magnitude of the potential risk to give an estimation of the risk prior to any mitigation measures. The risk management measures, which are designed to reduce the likelihood of occurrence, are then detailed followed by an estimation of the actual risk post-mitigation (Residual Risk Rating).

The DEFRA guide to risk assessment[1] indicates the approach of subjectively classifying the magnitude of potential consequences into four categories depending upon the degree of the impact that the potential risk could have and the context in which the risk is being assessed. The classification is used as a guide in this Risk Assessment.

The four categories are as follows:

- **Severe:** Possible irreparable damage to environmental resources;
- **Moderate:** Possible damage to environmental resources which are limited within a regional context;
- **Mild**: Possible effects might be transient damage to environmental resources which are commonplace on a regional basis and alternative sources are readily available;
- **Negligible:** The effects are negligible or might cause very slight temporary deterioration in the current environmental resource quality.

The matrix shown below considers the probability of the potential risk against the magnitude of the potential impact, thereby giving an estimation of the resulting likelihood of the risk occurring.

Table 2.1: Risk Estimation Matrix

Probability of potential Risk	Magnitude of Potential Impact			
	Severe	Moderate	Mild	Negligible
High	High	High	Medium/Low	Near Zero
Medium	High	Medium	Low	Near Zero
Low	Medium	Medium	Low	Near Zero
Negligible	Medium	Medium/Low	Low	Near Zero

The qualitative risk assessment for the Accident Management Plan has been based on the matrix outlined above.

The final stage of the risk assessment is the judgement of the severity of the residual risk following implementation of the mitigation measures.

[1] A Guide to Risk Assessment and the Risk Management for Environmental Protection, 1995.

Table 2.2: Accident Management Plan					
Accident Scenario	**Probability of Accident Occurring**	**Magnitude of Potential Impact**	**Risk Rating before mitigation**	**Risk Management**	**Residual Risk Rating (following Mitigation)**
1 - Spills and Leaks / Loss of containment / transfer of Substances / Overfilling of Vessels	Medium	Moderate to Severe Spillage and leakage could occur during fuel deliveries, vehicle refuelling, vehicle breakdowns/ accidents and or damage to tanks or bunds Loss of containment could result in potentially polluting materials (including oils and chemicals) being discharged in surface water drainage systems and to controlled waters;	Low	• A sealed drainage and containment system for all tanks containing potentially polluting liquids has been constructed so that any leaks / spills are contained; • Electronic monitoring (i.e. level gauges, feedback loops etc) shall be installed on all vessels; • All external delivery areas are contained within a sealed drainage and containment system that incorporates bund walls, appropriate falls and drains; • All storage vessels have been constructed to the appropriate British Standard; • Tanks are inspected visually on a daily basis by site staff to ensure continued integrity of tanks, and identify any necessary remedial action; • Minor spills to be cleaned up immediately, using sand or proprietary absorbent. Resultant materials to be placed in container for off-site disposal to appropriate facility, if necessary; • Immediate action to be taken in event of major spill which is likely to cause polluting emissions to the environment to prevent liquid from entering surface water drains or any adjacent unsurfaced ground. Spillage to be cleared immediately and placed in containers for offsite disposal. EA to be informed; • The plant has been designed in order to include an automated shutdown facility; • The company has established emergency procedures CPP-E20.	Low
2 - Vandalism	Low	Moderate The site could be subject to intentional vandalism and	Low	• On-site security measures: • Security lighting 24 hours a day; • Security cameras are installed at key areas of the site; • Security fencing extends around the site perimeter; • – 2m palisade or equivalent;	Low

		damage by intruders/ trespassers who could cause damage or harm to the plant and equipments, spills and leaks to tanks or cause fires.		• Lockable gates are located at the site entrance; • Gates will be locked whenever the site is closed; • Gates and fencing are inspected daily by operations staff to identify deterioration and damage and the need for repair; • Fencing and gates are maintained and repaired to ensure their continued integrity. If damage is sustained, repair will be made within the same working day. If this is not possible, suitable measures will be taken to prevent unauthorised access to the site and permanent repairs will be affected as soon as is practicable; • Oil-water interceptors prevent the potential migration of contaminants caused by vandalism; • All visitors to the site are required to register in the visitor's book and sign out again on exit, thereby minimising the risk of unauthorised visitors on the site; • Operational procedures have been implemented including regular inspections, ensuring continual monitoring of security provision at the site.	
3 - Flooding	Medium: The majority of the site is located in Flood Zone 1 (low risk). The north-west boundary of the site is located within Flood Zone 2 (medium risk)	Severe	Low	• All activities at the installation are carried out internally and have sealed drainage and bunding systems which will prevent the inflow of off site flood water into critical areas (bunds, tanks, storage etc). • In cases of extreme rainfall, the site containment systems will contain all water falling on site; • The main elements of the development are located in the area of medium risk, only some tanks and minor buildings are located in the area of high risk.	Low
4 - Fire in pyrolysis plant. Plant malfunction; Electrical equipment that could provide an ignition source;	Medium	Severe	Medium	• All plant is subject to a planned preventative maintenance schedule (CPP-E15 Infrastructure Monitoring and Cleaning Programme) • All plant has been specified to be intrinsically safe and earthed in accordance to best practice; • All aspects of the plant and buildings are constructed of non combustible materials; • The plant has been designed to shut down (fail safe) in the event of an	Low

Waste products / raw materials that may support combustion.				emergency (all gases will be directed to Emergency Flare) • Containment system: all tanks and vessels containing flammable and potentially polluting liquids are constructed so that any leaks/spillages are contained and responded to in accordance with established emergency procedures; • Fire suppression (utilising Nitrogen) and monitoring systems have been installed; • Separation of combustible materials from the source prior to processing; – All waste feed stock is stored within dedicated bays Zone 1; – All flammable process consumables shall be stored in bunded tanks. • In the event of a fire, the following actions will be taken: – The fire brigade will be notified immediately and the EA as soon as practicable. – All containment valves and systems will be closed. – The site will be immediately evacuated. • Records of fire incidences will be kept on site together with a summary of remedial action taken. • The entire site will be subject to a third party DSEAR assessment and all recommendations / mitigation measures incorporated • The EA will be advised of all incidents of fire as soon as is practicable; • Smoking will not be permitted in the operations areas of the site. • Automated fire sprinkler systems have been installed within the Reception Area (Zone 1).	
Incompatible Feedstock/ Unwanted Reactions: Some of the raw materials and waste inputs at the site could contain impurities that impede / prevent the pyrolisis process.	Low	Moderate / Severe	Low	The following methods will be implemented to ensure that incompatible feedstocks do not compromise the safe operation of the plant: • All wastes accepted onto site have been subject to 'pre-acceptance' in accordance to established procedure CPP-E01; • All incoming wastes are inspected in accordance with established procedure CPP-E02; • When in the waste reception area, any non conforming waste will be removed prior to acceptance in accordance with established procedure CPP-E03; • The upstream autoclaving process removes any extraneous material (i.e. recyclates etc) and produces a homogenised, organic flocculent that is exclusively utilised within the pyrolisis process; • Records of incidents involving incompatible compatible will be kept on site together with a summary of the remedial action taken.	Low

				• The company has an established Emergency Response Procedure CPP-E20	
Failure of Mains Services: Failure in the mains services, water or electricity.	Medium	Low	Low	In the event that mains services of water and electricity supplied to the site are unavailable, the following actions will occur: • In the event of sudden disconnection of the grid the ID fan will cease to operate, thus no emissions will be released to atmosphere; • All pump sets will cease operating so no further transfer of material can occur; • The boiler plant shall shutdown, thus rendering the plant inoperable. The emergency back-up generators shall be active in the event of a mains grid failure.	Negligible
Operator Error / Failure of Equipment: The unexpected breakdown of any part of the plant could result in short term build up of waste in the reception areas or the incomplete treatment of waste. The result of operator error could result in the plant not functioning efficiently or a risk of fugitive emissions to air through uncontrolled decomposition of biological waste.	Medium	Low	Low	The plant has been designed with a number of fail safe and automatic shutdown systems, where appropriate. • The design of the plant includes sufficient storage capacity for a number of weeks production and waste storage; • Should the above storage capacity be exceeded, incoming waste can be diverted to the adjacent composting and / or landfill facilities. • Redundancy measures have been incorporated into the plant design, such that the site can continue to operate in the event of major plant failure (i.e. such as the E-Claves, pyrolysis units etc). • All pressure vessels and steam equipment will be designed to appropriate standards and be subject to HAZOP and HAZID assessments to ensure that any catastrophic failure madoes are engineered out of the system. *The above capacity measures allow waste to be received while equipment repairs are affected.* • All equipment is subject to a Planned and Preventative Maintenance Programme (PPM), to minimise unplanned failures (CPP-E15 Infrastructure Monitoring and Cleaning Programme) • The plant also has in place a number of Emergency Shutdown Controls to ensure safe shut down in emergency.	Negligible

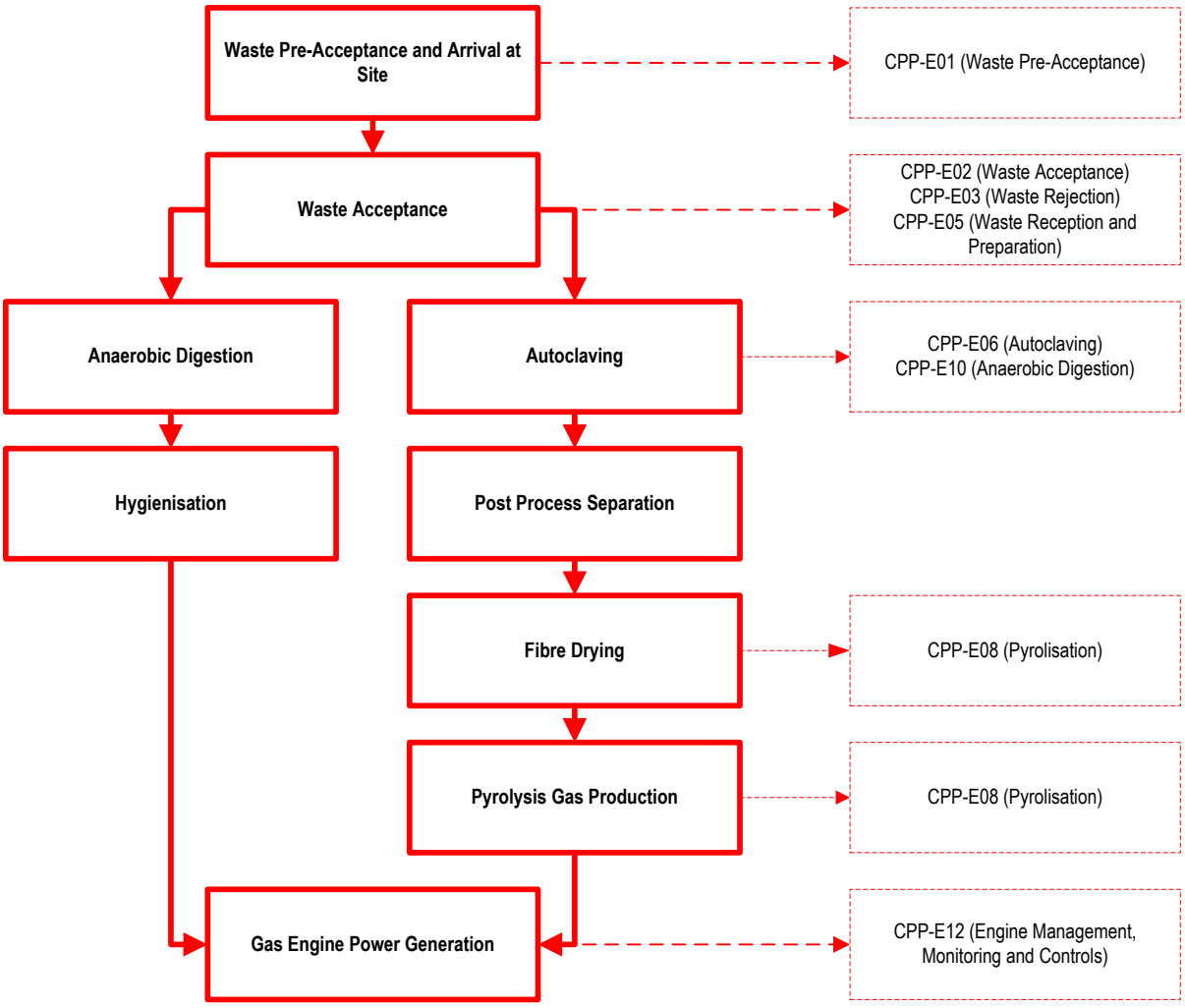
3 SUMMARY & CONCLUSION

This document has been prepared to meet the requirements pertaining to Accident Management Plans within the Environment Agency guidance document EPR1.00 *'How to Comply with your Permit'*.

It is concluded that despite the Installation having the potential for a low-moderate environmental impact to the environment, the mitigation measures incorporated into the design of the plant and the site infrastructure are sufficient to mitigate the risks

The company operates and continues to operate using an established suite of procedures for the control and management of all materials and plant in use in their process. These procedures detail the required actions to be taken in the event of an emergency and should be used in the first instance for any accident and emergency at site.

A procedural map of the site working plan is provided in Figure 3.1 below. Please refer to the Site Working Plan Manual (Ref. CPP-SWP).



ANNEX 1: Working Plan Structure

Table 3:12 Working Plan		
Ref No:	**Title**	**Purpose**
CPP-E01	Waste Pre-Acceptance	This procedure defines the upstream screening, checking and pre-acceptance of all incoming waste prior to its arrival on site.
CPP-E02	Waste Acceptance	This procedure outlines the onsite controls and considerations that need to be applied when waste materials arrive on site for processing.
CPP-E03	Waste Rejection	This procedure outlines the waste rejection process for all non-conforming wastes that cannot be processed on site. Acceptance of non-conforming wastes will be a direct breach of the permitted conditions of the sites Environmental Permit.
CPP-E04	Off Site Waste Transfers	This procedure provides the necessary information to enable the assessment and off site transfer of non-conforming or untreatable waste streams.
CPP-E05	Waste Reception and preparation	This procedure outlines the waste reception, storage and autoclave/anaerobic digestion loading processes for all incoming waste.
CPP-E06	Autoclaving	This procedure defines the processes and stages of the autoclave process.
CPP-E07	Recyclate Management	This procedure defines the recyclate management and control process.
CPP-E08	Pyrolisation	This procedure defines the stages and control measures for the pyrolisation syngas generation process
CPP-E09	Slag and Ash Management	This procedure defines the condensate management and control process.
CPP-E10	Anaerobic Digestion	This procedure defines the stages and control measures for the anaerobic digestion process.
CPP-E11	Digestate Management	This procedure defines the digestate management and control process.
CPP-E12	Engine Management, Engineering and Controls	Procedure that outlines the required monitoring and analysis requirements for the operation of the gas engine generation sets, pasteurisation and digestion stages
CPP-E13	Environmental Records	This procedure defines the necessary Environmental Permit and Waste Records that are required to be managed by the site to ensure compliance.
CPP-E14	Environmental Monitoring Programme	This procedure provides an overview of all of the necessary environmental monitoring procedures and controls to ensure compliance with the Site Environmental Permit.
CPP-E15	Infrastructure Monitoring and Cleaning Programme	This procedure provides an outline of the inspection and cleaning requirements for the site.
CPP-E16	Accident Management Plan	This procedures refers to the sites emergency plans and response requirements
CPP-E17	Odour Management Plan	This document outlines the sites Odour Management plan and requirements
CPP-E18	Training	To ensure that all training needs are identified for a relevant personnel. In addition, educational and training qualifications and records are maintained.
CPP-E19	Security	To ensure that all site and driver security controls are implemented and maintained to minimise security risks at Clean Power Properties.
CPP-E20	Emergency Procedures	To ensure the safe evacuation of the site and protection of the environment in the event of a site emergency.

Clean Power (UK) Ltd
Wheldon Energy Recovery Centre

Odour Management Plan

Prepared By:
Sol Environment Ltd

Date:
January 2013

Project Ref:
SOL1213CPP09_AB_OMP

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Annex A1: Building Odour Control Measures Illustrated

Annex A2: Potential Odour Receptors

Annex B: Failure and Abnormal Event Summary Table

Annex C: Example Olfactory Assessment Form

Annex D: Odour Complaint Report Form

Annex E: Responsible Persons

1 ODOUR MANAGEMENT PLAN

1.1 Introduction

This document has been prepared by Sol Environment Ltd on the behalf of Clean Power (UK) Ltd (in support of its Planning and Environmental Permit Application) for the operation of their proposed Wheldon Energy Recovery Centre.

The document provides a structured framework and approach in effectively managing potential odour releases associated with the operations at the site.

This Odour Management Plan document (referred hereafter as the 'OMP') has been produced in accordance with the following documents:

- Environment Agency's Technical Horizontal Guidance Note '*H4: How to comply with your permit*' (V4 April 2011); and
- General monitoring procedures detailed in Environment Agency guidance document Internal Guidance for the *Regulation of Odour at Waste Management Facilities*.

The purpose of this document is to outline the management control measures that have been established to prevent and control odour emissions and associated impacts from the site.

1.2 Structure of Odour Management Plan

The OMP has been structured in accordance with the EA H4 Annex 7 '*Template for an Odour Management Plan.*'

The OMP considers the following aspects of the facility:

- Activities that have the potential to produce odour and sources of release;
- Potential outcomes of each failure scenario in respect to odour impact; and
- Actions to mitigate the effect of odour release (during normal and abnormal operations); and
- Details of responsible persons at the installation.

In addition, this OMP has been developed to clearly define the measures by which odour emissions will be controlled and prevented, namely by;

- Minimising the inventory of odorous materials;
- Minimising the evaporation of odour containing vapours into the air;
- Containment and abatement;
- Dispersion;
- Monitoring.

1.3 Status of the OMP

The OMP is a "live" document and will form part of the key environmental management document for the facility. All monitoring procedures, responsibilities and compliance actions will updated as and when required.

2 SITE BACKGROUND

2.1 Site Setting

The Site is located at Wheldon Road, Wheldon, Castleford, WF10 4SX.

The proposed development is a bespoke renewable energy and resource recovery centre that has been designed to recover all available recyclable materials from residual mixed waste feedstocks. The proposed development integrates the above technologies to provide a single treatment facility for solid wastes which would otherwise be destined to landfill or incineration.

The installation will process approximately 195,000 tonnes of non-hazardous waste comprising the following:

- A 12 MWe Pyrolysis ACT plant which will recover and recycle approximately 128,000 tonnes per annum of commercial and municipal mixed source waste; and
- A 2MWe AD facility which will recover approximately 67,000 tonnes per annum of food and food processing waste.

The site is bound to the north by Wheldon Road, to the east by the Wheldale Green Energy Park, to the south by the railway line and to the east by a disused mineral railway line (on embankment). The immediate surrounding area is occupied by a mix of industrial uses. The Castleford Tigers stadium is located to the north-west and west, with some residential properties and a sewage treatment works to the north-east, Fairburn and Newton Ings Nature Reserve to the north and public open space and residential properties to the south and south-west.

With this in mind the site is considered to be sensitive in relation to potential odour impacts. Potential odour receptors (i.e. the closest residential properties) which have been considered in the OMP are detailed in Section 2.3.

2.2 Facility & Process Overview

A number of proactive controls have been integrated into the Site Working Plans for the management and prevention of odour emissions arising from the proposed site activities. This document builds on these procedures and introduces further measures specifically for the control and abatement of emissions.

All personnel employed on site will be suitably trained and experienced at operating all plant and equipment associated with their particular role; especially with regard to those involved in potentially odorous activities. On occasions where these competent and experienced personnel are off work or unable to perform their role, the most suitable replacement will be sourced from the available workforce and any relevant training will be administered before they perform the task.

Waste Reception

On arrival to site, all incoming waste vehicles will report to the weighbridge. The appropriate waste consignment documentation will be examined to ensure that all wastes being delivered are acceptable under the EWC codes and conditions set by the Environmental Permit.

All incoming waste vehicles will be weighed, before being directed to the main reception building for the delivery of the waste. All vehicles arriving at site will be sealed and designed for effective control of odour.

Loads will be inspected visually to check for contaminants, unsuitable or prohibited materials. All personnel on site will be suitably trained to identify wastes which are not permitted for treatment under the Site Permit. The updated list of acceptable EWC Codes will be available in the weighbridge office. Highly contaminated waste and materials non-conforming to the EWC Codes provided will be rejected (whole or part load as appropriate). No malodorous wastes will be accepted at site.

Rejected loads will returned directly to the consignee with the expectation that the originator will be required to provide a written explanation, along with any future measures they will take to minimise the chance of a repeat event. If a particular customer persistently fails to meet the load requirements determined by the Site Manager; the plant management team will 'blacklist' either the customer or the waste stream for an appropriate period of time. All events will be documented in the site diary; records will be kept within the office and all staff will be made aware.

Wastes will be transported in covered and enclosed vehicles, most wastes will be transported in sealed bags and containers or vehicles. The likelihood of delivery vehicles having to wait in the yard for prolonged periods is minimal, due to the rapid turnaround of vehicles within the waste reception area. No open top vehicles carrying any putrescible or potentially odourous wastes will be accepted at the facility.

All waste acceptance and reception activities are carried out in accordance with CPP-E01, E02, E03 of the Site Operational / Working Plan.

The reception of all mixed solid waste (MSW) will take place within the main waste reception area (Zone 1 of the main building).

Zone 1 of the building is a purpose built, sealed internal reception area which is operated under negative pressure in order to mitigate potential odour dispersion impacts. The reception hall has been designed with an internal lobby that is if fitted with extraction to ensure that an effective building seal is maintained.

Vehicles will access the internal waste reception and dispatch areas of the internal waste reception area by a number of doorways, comprising externally mounted heavy duty metal roller shutter doors (for overnight site security), with internally mounted rapid-closing heavy-duty polyethylene roller shutters to permit access in and out of the building by vehicles during normal working hours. The roller doors will be opened twice for each delivery in order to let the vehicle in and out of the building. The door will be kept closed whilst the vehicles are unloading waste within the building. Each of the inner roller shutter doors is fitted with perimeter air curtains for the purposes of maintaining air pressure controls during the periods when the doors are opened.

The reception area comprises a number of sealed isolated bays fitted with push floor transfer system.

The physical reception area will be designed in order to accommodate Rear End Loader (REL) vehicles (which will form the typical 'bin wagon' vehicles used for municipal waste collection) and walking floor (curtain sided) transporters. The reception areas comprise an initial holding bay and associated transfer systems. All solid wastes will initially be discharged onto the reception area and undergo initial inspection, prior to being transferred directly into the loading system of the autoclave for steam sterilisation.

The waste reception area and loading system consists of the following:

- Weighbridge (capable of taking the full range of delivery vehicles);
- In-feed ferrous magnet (for the removal of oversized metals);
- In-feed shredder (capable of shredding c.30 Tonnes per hour);
- Mobile crane (capable of lifting c.4 Tonnes of waste per grab);
- In-feed conveyor system (capable of delivering full load to autoclave in approx. 15 minutes);
- In-feed weighing system (to register accurate batch weights); and
- Hydraulic moving floor.

Once unloaded, vehicles will be inspected and returned to the weighbridge.

Any wastes which do not conform to the requirements of the site, i.e. contain specific hazardous contaminants (oil, solvents, car batteries, WEEE etc), exceed the size requirements etc, will be segregated and isolated / quarantined.

All non-conforming wastes will be rejected in accordance with the site waste rejection procedures.

Competent Operator Absenteeism

All operations will be performed by competent and trained individuals who are both suitably qualified and experienced. Should an operator not be present, the most suitably experienced operator will be used as a replacement. Relevant training will be issued as necessary and overseen by the Company's 'Technically Competent' Person, this will occur for each and every instance where personnel have time off throughout the year, across the entire business.

2.3 Nearest Sensitive Receptors

All residential receptors are listed in Table 2.1 overleaf.

Table 2.1 Location of Sensitive Odour Receptors				
ID	Receptor	Type	Ground	Distance and Direction to Site Boundary
R1	Elder Bank House	Residential	Ground	c. 570m E
R2	1 Fairview	Residential	Ground	c. 705m E
R3	36 Stansfield Close	Residential	Ground	c. 490m SE
R4	Wheldale Court	Residential	Ground	c. 500m SE
R5	22-29 Stansfield Close	Residential	Ground	c. 530m SE
R6	41 Foss Walk	Residential	Ground	c. 630m SE
R7	10 South View	Residential	Ground	c. 1.3km NE
R8	323 Fryston Road	Residential	First	c. 1.15km E
R9	Hilltop Close	Residential	Ground	c. 210m S
R10	161 Healdfield Road	Residential	Ground	c. 250m S
R11	101 Healdfield Road	Residential	Ground	c. 270m S
R12	Healdfield Road	Residential	Ground	c. 230m SW
R13	Healdfield Road	Residential	Ground	c. 260m SW
R14	Castleford High School	Commercial	Ground	c. 620m SW
R15	6 Boston Street	Residential	Ground	c. 610m SW
R16	7 Lincoln Street	Residential	Ground	c. 625m SW
R17	62 Princess Street	Residential	Ground	c. 390m W
R18	12 Princess Street	Residential	Ground	c. 400m W
R19	1 Hepworth Street	Residential	Ground	c. 270m W
R20	118 Wheldon Street	Residential	Ground	c. 150m W
R21	128 Weldon Street	Residential	Ground	c. 145m W
R22	92 Wheldon Street	Residential	Ground	c. 540m W
R23	Property above 1 Queen Street	Residential	First	c. 730m W
R24	Property above Gobson Comps	Residential	First	c. 880m SW
R25	St. Joseph's School	Residential	Ground	c. 910m SW
R26	Property above Magic Wok	Residential	First	c. 925m W
R27	Property above One Call Accountants	Residential	First	c. 980m W
R28	Property Above Star Fisheries	Residential	First	c. 1 km W
R29	Property above The Lion	Residential	First	c. 1.1km W
R30	20 Saville Road	Residential	Ground	c. 1.26km W
R31	1 Bridge Street	Residential	Ground	c. 860m SW

Please Note; The distances noted above are to the nearest practical boundary. In reality, distances to odorous activities will be greater. Annex A2 shows a map with the locations of the nearest sensitive receptors.

Due to the proximity of the nearest residents, the site is considered to be sensitive in relation to odour impact however the highest level of odour control and mitigation has been applied to site to ensure that all potential odour releases are prevented.

2.4 Off-site odour sources

The Wheldon site is not surrounded by any neighbouring industrial processes considered to have a significant potential for odour issues.

3 POTENTIAL ON SITE ODOUR SOURCES & ACTIVITIES

The site operations have been designed with a hierarchy of odour control measures, all of which are considered in the context of the installation setting, frequent waste operations and abnormal activities.

The key operations with the potential to produce and release odour at the facility are described below. This OMP has been developed to ensure that potential odour, from each part of the process, is minimised through effective management to an acceptable level.

3.1 Receipt of waste and off-loading

All wastes received by the site are delivered directly into the pressure controlled Waste reception Area (Zone 1) specific areas as described below and shown visually in Annex A2:

- Segregated food wastes – delivered directly to the internal inlet feed hopper within the enclosed Reception Building (Zone 1) where it will be macerated, blended and pumped directly into the digestion tanks.
- Mixed source waste ('MSW') – tipped within the enclosed Reception Building (Building Zone 1);

The main reception building is a sealed building and is served by a dedicated extraction and abatement system (see Section 4.2). The building will be fitted with an internal 'double' lobby which is fitted with extraction to ensure that the pressure control can be maintained at all times.

The Waste Reception and Processing Building will be operated under negative pressure system, drawing air from within the building and extracted to the pyrolyser combustion intake fans for use as combustion air and thermally oxidised.

This system will use conventional stainless steel ductwork and extractor fans to maintain a slight negative pressure (nominally maintained at approximately -50 Pa) through the building, thus minimising the potential escape of odour and bio-aerosols from the building. All wastes received are stored within enclosed containment (via mixing / storage tanks or in-pipe systems) or transferred into the autoclaves as soon as practically possible.

The building also incorporates vapour capture and extraction canopies over the doors of the steam sterilisation units.

In addition to the above the reception hall is fitted with passive, Ultraviolet / Ozone odour control equipment within the roof space of the building. This equipment will effectively neutralise any odourous air within the building and reduce the potential for escape, as well as reduce the burden and dependency of the extraction plant..

Waste will not be stored for more than a couple of hours before processing and will generally be processed within the same day. The swift processing of waste is a key aspect in avoiding the potential for the putrification of waste and creation of anaerobic conditions within the waste reception area.

The potential for odour generation during the receipt, offloading and shredding of waste materials is directly influenced by the nature of the incoming wastes and the extent of any degradation. The extent of degradation of

raw materials will effectively be determined by the age of the waste and ambient temperatures, i.e. during hot periods of extended retention, materials with higher odour potential will inevitably be delivered to site.

A dedicated internal reception bay will be provided for the anaerobic digestion plant. Pure biomass matter will be macerated, blended and immediately pumped directly to the digestion tanks, therefore ensuring all odour generating activities are enclosed within the process building and AD tanks.

The reception, discharge and processing of wastes within the sealed building is the key control measure for minimisation of odour emissions.

Table 3.1: Summary – Waste Reception

Primary Odour Sources	Key Control Measures
• Odourous incoming waste due to quality of material; influenced by moisture, age, degradation, ambient temperature, organic content etc; • Arrival of new waste on-site; • Off-loading waste on-site; • Stockpiling of potentially odorous waste on site for prolonged period before processing.	• All vehicles containing potentially odourous materials will be sealed; • Reception of waste within an enclosed pressure controlled building; • Building fitted with a extracted double lobby to prevent any risk of odour escape; • Dedicated extraction system to maintain building at negative pressure; • The reception hall is treated with a network of Ultra Violet / Ozone roof mounted treatment devices; • All extracted air is thermally oxidised through the process prior to the discharge to atmosphere; • Inspection of all incoming wastes to ensure the waste is contained sufficiently and is not too odorous or contaminated e.g. a suitable bin and safely sheeted/covered, following procedure for rejection of unacceptable loads; • Processing of potentially odorous materials within the same day of receipt on site; • Communication with customers to ensure that materials are delivered to site before developing unacceptable odour e.g. not to stockpile potentially odorous materials for long periods before delivery; • All internal extracted air thermally oxidised prior to discharge; and • Immediate storage within enclosed systems (i.e. storage tanks) or transfer into autoclave units.

The majority of waste streams that will come into the site will, unless appropriately managed cab have the potential to produce offsite odour impacts. Table 3.2 provides the details of the necessary odour management conditions to avoid offsite nuisance issues.

Table 3.2: Potentially Odorous Incoming Waste Sources			
Type/Source/Quantity	Typical Age and Storage Conditions	Seasonal Variations and Odour Implications	Management Considerations
Mixed Source Waste Local District Council municipal waste from transfer station and municipal waste bin collections	Stored in household or commercial wheeled bins for up to 2 weeks before collection; either delivered directly to site or bulked up at transfer station for delivery to site within 3 or 4 days.	Due to the nature of municipal waste, the composition will not vary significantly through the year. This is primarily due to pre-collection sorting facilities (for green waste and recyclables is particular) provided by the Local District Council. Odour implications: Degradation could begin rapidly during summer months with increased ambient temperatures. Excess nitrogen will form ammonia and odourous compounds.	Ensure all MSW received is stored within the dedicated internal Reception Area prior processing. In the event of "surge" overwhelming the site's capacity, material to be diverted to alternative site or sent to landfill.

3.2 Autoclaving

All mixed waste will be inspected and directed in to the autoclave units via a materials conveyor, where they are undergo a pressure sterilisation cycle in order to convert the waste to a sterile recovered biomass fibre and sterilised recovered recyclables.

Post autoclave processing involves mechanical segregation where all recyclates are recovered and the subsequent remaining biomass is directed to a storage hopper. Pressure sterilisation of the recovered biomass material (at temperatures exceeding 160ºC), reduces the overall volume of material by 80% and removes any potentially odourous content of the biomass.

The autoclaving system is fully enclosed and has dedicated extraction hoods which discharge to the air intakes of the thermal oxidisation plant.

The main potential odour source from the autoclave relates to the extracted steam and condensate. To ensure that the escape of steam is minimised from the door system, the autoclave has been designed to be taken from positive pressurisation to vacuum prior to the door being opened.

This has the effect of 'flashing off' any steam thus allowing all the steam to be extracted and condensed prior to the door being opened. Any remaining vapour emanating from the treated materials will be captured by the steam extraction systems, condensed and treated by the water treatment plant. The design of the water treatment plant ensures that there are no impact to air associated with the condensate treatment.

All autoclaved material is discharge onto a conveyor system that is fitted with extraction.

All extraction is routed back to the thermal oxidiser plant (air intakes of the charcoal combustion system).

All autoclaved fibre material is stored in sealed vessels and before introduction to the pyrolyser for thermal recovery.

Table 3.3: Summary – Autoclaving

Primary Odour Sources	Key Control Measures
• Conveyance and autoclaving of municipal waste • Storage of processes autoclaved fibre	• Autoclaving process is entirely enclosed; • Processing at high temperatures removes all malodorous content; • All condensate is extracted from autoclave and treated in waste water treatment plant to remove any odourous content, prior to the doors of the autoclave being opened; • Autoclave doors have air extraction hoods that are routed to thermal oxidiser; • All treated materials are discharged onto a extracted conveyor system; • Resultant 'odourless' biomass fibre produced comprises an inert, odourless flocculent; and • Biomass fibre is transferred directly to pyrolyser and dried in situ to remove any remaining moisture content, all extracted 'moisture' is treated by the extraction system.

3.3 Pyrolysis and Syngas Combustion

The recovered biomass fibre is then fed directly by sealed auger into the pyrolysis units (comprising sealed pre-heating and main gasification chambers) and pre-heated by hot gas to an elevated uniform temperature (c. 700ºC).

During pyrolysis the biomass is thermally degraded to form a clean charcoal and synthesis gas ('syngas'), which is cleaned and used for power generation. All gas is treated through a water quench and recovered via a water treatment system.

Treated synthesis gas is then stored in a gasometer and then used to operate industrial gas CHP engines to produce electricity and heat. All air emissions from the engines are discharged to atmosphere via an SCR abatement plant order to ensure that air quality impacts are minimised.

Table 3.4: Summary – Pyrolysis & Syngas Combustion	
Primary Odour Sources	Key Control Measures
• Transfer of biomass fibre to pyrolysis unit; • Combustion of synthetic gas; and • Propagation of odour through external atmosphere.	• Transfer of biomass fibre occurs via a sealed measuring conveyor, within an enclosed building; • The Pyrolysis or biomass fibre is a completely enclosed process within a sealed unit; • Resultant syngas is fed directly to the gasometer via a scrubber and waste water recovery system; • Emissions from the combustion of syngas are thermally destructed prior to discharge to atmosphere.

3.4 Digestion and storage

Food waste will be pumped into two digestion units directly from within the Zone 1 sealed and pressure controlled reception area of the main building. All waste is immediately discharged into a 40m3 pit, macerated and pumped directly into the digestion tanks.

The waste undergoes anaerobic digestion for a period of approximately 64 days during which fermentation occurs to produces a methane-rich biogas.

Odour impacts associated with the transfer of materials from the Reception Building to the digestion tanks has been completely eliminated through the use of fully enclosed pumping systems and sealed connection pipes.

The potential production of odourous gases within the anaerobic digestion process (hydrogen sulphide (H_2S, a common by-product of anaerobic digestion)) is mitigated through utilisation of two chemical dosing systems. The primary system injects a small quantity of O_2 into the gas storage region of the tank (i.e. headspace beneath the double membrane membrane roofs). If oxygen injection is not sufficient to reduce the levels of H_2S, secondary odour reduction is achieved through the addition of Ferric Sulphate. Ferric Sulphate is directly dosed into the digester.

All vents and extracts (membrane roof extraction, vent relief valves, breathers etc) from the digestion and digestate tanks are routed back into the intake of the thermal oxidiser within the main building. There are no physical releases of any odourous emissions to the environment from the AD process.

The digestate product from the primary AD process is stored in two enclosed secondary digestion tanks (30m x 6m) for up to 4 months to allow for secondary gas production.

All digestate will be pumped to a sealed pastuerisation batch tank where it is heat treated, filter pressed and transferred into a sealed tank, located within Zone 2 of the man building. All pasteurised liquid digestate will be exported off site within tankers and used for agricultural fertilisers. Any delivery and collection tankers on site will be required to couple up to a dedicated extraction system that is connected to the main thermal oxidisers / odour treatment plant.

All treatment of digestate takes places internally, i.e. within the pressure controlled building. There is no external handling, treatment or storage of digestate in any form at the site.

All solid filter cake arising from the filter press will be transferred directly in to the autoclave plant for treatment.

Table 3.5: Summary – Digestion and Storage	
Primary Odour Sources	Key Control Measures
• Transfer of materials from Reception Building to external tank farm; • Production of malodourous H_2S; • Venting of AD tanks; • Venting of Delivery / collectin vehicles • Handling and treatment of digestate; • Exposure to odorous content during dispatch	• Reception building a sealed pressure controlled environment • Immediate direct pumping of waste from Reception Building / Tanks in sealed pipes; • Injection of Oxygen and Ferric Sulphate to alleviate H_2S levels; • All vents and extracts from the AD tanks are routed back directly to the odour abatement / extraction plant; • All collection and delivery tanker vents coupled to the odour abatement and extraction plant; and • All digestate processed within sealed buildings with odour abatement.

3.5 Treatment of Biogas

The biogas produced in the digesters will be saturated with water and has the potential to contain residual odorous gases (Hydrogen Sulphate, Ammonia). Prior to combustion of the gas, the biogas is dewatered by condensation in an underground gas pipe. All condensate will be collected by condensation wells and pumped to the water treatment plant for treatment.

The dry gas will then be recirculated through a dry carbon filter for the purposes of removing any residual odourous gases or other volatile odorous content.

Table 3.6: Summary – Treatment of Biogas	
Primary Odour Sources	Key Control Measures
• Presence of volatile odorous content / residual odourous gases within biogas.	• Dewatering of biogas and re-feeding of condensate into the digesters; and • Use of a carbon filter to capture residual odorous elements of the biogas.

3.6 Pathways

Any odours produced from any aspect of the plant have the potential to be emitted to air directly and have the potential to be carried to the nearby receptors via the atmosphere.

The extent of which odour is detectable downwind and the intensity and character of such odours is dependent on the flowing factors:

- The nature and magnitude of odorous emissions released from the source.
- Wind direction and wind speed.
- Atmospheric turbulence (vertical and horizontal) and the level of dilution and dispersion odours undergo as they travel downwind.

All these factors can vary significantly over time.

4 CONTROLMEASURES

The facility has been designed with a hierarchy of odour control measures based around the operational requirements of the site been aligned with sector best practice.

The working plan and associated operating procedures have been developed in accordance with the requirements of the Environment Agency EPR Horizontal Guidance Note H4 Odour Management.

The following sections detail management techniques, procedures, and odour control measures to minimise the potential for odour generation for each aspect of the operations, supplementing the information provided in Section 3.

4.1 Hierarchy and Principles of Odour Control

The key factors regarding the control, minimisation and abatement of odour emissions are:

- Inventory Control;
- Air tight / sealed pressure controlled buildings;
- All AD tank and delivery/collection vehicle vents and breathers are connected and routed to main pyrolysis thermal oxidiser plant;
- Process Control, odour control and gas clean up technology;
- Thermal oxidisation and odour destruction and
- No external handing or storage of digestate .

Details of each of the above factors are provided within the sections below;

Inventory Control

All wastes are loaded and unloaded within the reception hall. No wastes of any variety are stored or processed externally.

All waste will be immediately loaded and processed through the autoclave and steam sterilised. The autoclaves have the capacity to process wastes at a rate equivalent to 2.5 to 3 times of the daily average delivery rate.

Having the capacity to process wastes at a far greater rate than the rate of delivery, allows the reception hall to be managed with little or no accumulated wastes. It is the basic principle of the site that the reception hall is emptied and cleared of waste at the end of each working shift and that all wastes are processed as soon as possible.

By managing the reception hall with little or no accumulated wastes, the potential for significant odour issues are minimised and prevented.

As an additional measure, before any new waste streams or customers are taken on; potential odour emissions of the new feedstock materials will be a key factor to consider before they are accepted for receipt at the site.

Air Tight / Sealed Process Controls

The building has been designed to be both airtight and operated under negative pressure. The negative pressure is maintained at all times, irrespective of the operational state of the plant.

All vehicle access doorways into the reception area are equipped with entrance lobby, operated under negative pressure and are fitted with air curtains to maintain building pressure integrity during deliveries.

Sealed Tanks, Vents and Vehicle Measures

All tanks vents, extraction and breather pipes are directly routed to the extraction ductwork within the main building.

Physical connections will be provided for each tank, via an underground duct, directly back in to the main building and into the main extraction system inlet.

All vehicles that are required to collect digestate will also be connected to the same extraction system, thus preventing ay uncontrolled releases of odour from either the tanks or tankers.

There will be no aspects of the anaerobic digestion plant or collection / delivery vehicles that will discharge tany odourous or potentially odourous emission to air.

Process Control Measures

Operational techniques to minimise odour during receipt and off-loading include;

- Site management shall work with suppliers to ensure that waste volumes are consistent during peak seasons (in the event of deliveries that exceed the site permitted capacity, waste shall be diverted to a suitably authorised site);
- All wastes transferred to site for processing will be delivered to site within enclosed vehicles and tankers.
- Non-conforming loads shall be rejected and removed from site in accordance to waste procedures (CPP-E03);
- The process is entirely enclosed;
- The most odorous stages of the process occur within the Reception Building where adequate pressure control is maintained by sealed entry / exit points (excluding periods of delivery) and negative air pressure is maintained in order to sufficiently contain any contaminated air.
- Reception hall is also fitted with roof mounted ozone / Ultraviolet treatment equipment which is recognised by the Environment Agency as being a highly effective ‘passive’ treatment measure for the treatment of waste reception halls;
- Operational areas shall be maintained in a clean condition and regularly scraped/swept in accordance with procedure (CPP-E15).

Any wastes exhibiting offensive, intense or other aggravating odour characteristics will be noted in the site diary. If incoming loads are too odorous on receipt, the following will be considered by the site management.

- Blend with less odorous waste and or carbonaceous materials in order to reduce the amount of waste with problematic odour.
- All potentially odorous MSW loads shall be tipped within Zone 1 of the enclosed reception and processing building and inspected on arrival for contaminants or excessively odorous material (in accordance with site pre-acceptance and acceptance procedures – CPP-E01 and CPP-E02 respectively).
- Non-conforming loads shall be rejected and removed from site in accordance to waste procedures (CPP-E03).
- Reject materials from being tipped, load back onto vehicle for removal from site or processing within the Energy from Waste installation.
- Divert waste to landfill.

Thermal Oxidisation and Odour Destruction

All air removed from the reception area and autoclave ventilation systems will be extracted by the induced draught fans associated with the pyrolyser combustion systems. This system is also directly connected to all Anaerobic Vent pipes and extracts. All tankers deliveries and connections will also be coupled to the system via a flexible external connection point.

The internal air conditions shall be maintained at negative pressure (c. -50 Pa) via utilisation of air intake dampers, therefore facilitating a fully-enclosed and sealed building and odour control system.

A dedicated extraction fan (installed in the roof void of the Reception Building) will maintain an air exchange rate at approximately 3 changes per hour. Air will be extracted from the Reception Building and directed to the air intake of the pyrolysis unit and used for combustion air, thus ensuring thermal oxidisation of any odorous content.

The site is fitted with 4 independently operated thermal oxidisation plants, each with sufficient capacity to provide reception hall and / or autoclave extraction.

In the event that none of the thermal oxidisation plants are not operating, the site is fitted with a backup fluidised bed bio filtration plan which has at least 20 times more active surface area per unit volume than the most efficient static bed bio filters with a removal efficiency greater than >90% for TRS (total reduced sulphur), VOC's and sulphide compounds.

Autoclaving, Pyrolysis and Syngas Combustion

To minimise potential odour emissions from the biofuel production and energy generation process the following operational techniques shall be applied;

- The autoclaving process is a sealed process that is carried out within an entirely enclosed building that is pressure controlled and abated. All odour emissions shall be thermally oxidised through the combustion air systems and released to atmosphere via the thermal oxidiser.
- The autoclave doors are interlocked to ensure all steam and vapour is evacuated to prevent heat and steam losses. Upon opening, a small amount of flash steam vapour will be released and extracted by the

autoclave door extraction hoods. All recovered steam is then condensed and the water is subsequently reprocessed through the water treatment plant. This water is then reused as boiler make-up water. This closed loop system minimises the potential release of odours.

- Each batch of waste inserted into the autoclave shall be processed at temperatures of at least 160ºC, this processing removes all malodorous content and converts the waste material into a sterile non-reactive biomass fibre.
- Syngas produced by the pyrolysis unit will be pumped directly to the gasometer via a scrubber and waste water recovery system;
- All steam is condensed from the autoclave by vacuum;
- Condensate from the autoclave process is discharged to the water treatment plant within the process building, so any odour emissions from this source will also pass through the odour abatement system and gas engines prior to discharge from the building.
- The process is entirely automated and monitored in accordance with Site Working Plan – Procedure CPP-E14.

Digestion & Storage

To minimise potential odour emissions from the production and storage of digestate, the following operational techniques shall be applied:

- Both digester tanks can be fed directly from the waste reception area via sealed pipework.
- Any H_2S generated in the digesters will be reduced by directly injecting O_2 into the gas storage chamber (headspace beneath the membrane roofs). If levels are particularly high and O_2 addition is not sufficient, Ferric Sulphate will be injected to the digester. The quantity of H_2S generated will depend entirely in the feedstock, fluctuations will be prevented through the upstream homogenisation and mixing process;
- All gas storage tanks will be fitted with a sealed double membrane roof;
- All vets and extractions from the AD tanks are routed back to the thermal oxidisation plant;
- Sterilised digestate is stored in an enclosed storage tank prior to removal from the plant;
- All acceptance, pre-treatment and processing tanks will be equipped with level gauges and alarms.

It is key to note that no external handling, treatment or storage of digestate is taking place on site. The site does not have any storage lagoons. In all cases digestate is stored in sealed tanks, which in all cases are vented back into the main odour abatement plant.

Treatment of Biogas

To minimise potential odour emissions from the production and storage of biogas, the following operational techniques shall be applied:

- The biogas will be dewatered (by cooling) prior to combustion in the CHP plant.
- All biogas will be circulated through an inline dry carbon filter, comprising activated charcoal media. The purpose of this plant is to remove any trace hydrogen sulphide emissions and other odorous content generated by the digestion process;

- The biofilter will be itemised under the site planned preventive maintenance programme (facilitating the replacement / recharging of carbon media on a regular basis) and maintained under service contract by OEM contractor.

Controls of Vehicle Deliveries

In order to prevent odour issues resulting from vehicle deliveries the Energy Recovery Centre will be supported by an agreed Delivery and Servicing Plan (DSP). The DSP will include a route management plan, restrictions on delivery hours and controls on types of vehicles.

The DSP will detail the vehicle types and their means of enclosure which will be agreed prior to the facility being brought into use. Most organic material received on site will be non-odorous, however any vehicle that will be delivering loads which may have an odour that is likely to have a detrimental impact on residential amenity will be transported in an enclosed trailer.

All vehicles (tankers) either delivering materials or collecting digestate from site, will be required to connect up to the odour extraction system (thermal oxidiser).

4.2 Liaison with Neighbours

If an action is being considered that may cause temporary odour impacts outside of the normal operational procedures, then the Local Environment Agency area team will be informed in advance. Neighbours who may be affected (see Table 2.1) will be contacted to advise them of the operation being undertaken, and that any increase in odour will be of a temporary nature.

In addition, the site will engage with the local community as often as possible in order to alleviate against negative site perception. The site management shall operate a publically accessible website, whereby pertinent and contact information is published such that the public remain informed and are provided with a means of contacting the site if necessary.

In the event of a complaint received from the public, Clean Power Properties operate in accordance with the dedicated odour complaints procedure (See Section 6.5).

5 FAILURE / ABNORMAL EVENT SCENARIOS

In accordance with the requirements of Environment Agency's draft Technical Guidance Note H4, consideration has been given to the types of failure or abnormal events that have the potential to result in an odour impact.

Abnormal events include the following:

- Meteorological conditions and
- Failure of process control measures.

Failure and abnormal event scenarios are presented in Annex B and summarised below.

5.1 Abnormal Meteorological Conditions

A number of meteorological conditions can exist that promote the generation of odour and may inhibit its effective dispersion (i.e. high temperatures and still conditions) may result in increased risk of impact at receptor locations.

The company management shall monitor meteorological forecasts to understand the prevailing conditions and to ensure that any activities which may give rise to increase odour potential cause are carried out in favourable meteorological conditions to reduce the potential for impact.

5.2 Failure in Process Control Measures

Failures in the process control measures have the potential to result in a release of odours which could impact nearby receptor locations.

Potential failures on site are summarised in Table 5.1:

Table 5.1 – Potential Failures in Process Control Measures

- Failure of E-Claves / Pyrolysis Units / Syngas Engines/Anaerobic Digestion plant, which may result in a delay in processing the material received. Magnitude of impacts will depend on the length of the breakdown, the type and volume of waste received and the prevailing meteorological conditions by could potentially result in elevated odour concentrations at receptor locations.

- Failure of Thermal Oxidiser Plant, which may result in failure to comply with IED emission limits and the potential release of odorous emissions. In such cases all plant will enter in to a controlled shutdown and the standby odour abatement plant utilised. Note that there 4 thermal oxidiser plants in operation at any one time.

5.3 Accident Management Plan

The site maintains and accident management plan, detailed within Annex G.

6 MONITORING

The company will employ the following monitoring techniques to ensure that the Key Control Measures (Section 4) are maintained and effective, operational procedures are followed and that good practices are being followed.

- Site inspections by the Site Manager or delegated personnel;
- Site audits and inspections by the Environmental Agency;
- Site Inspections by the Planning Authority; and
- Third party audits.

All plant monitoring equipment requires to be calibrated annually unless the manufacturer's recommendations recommend more frequent. Each piece of monitoring equipment will have a unique serial number and calibration records will be kept in the site office. When a piece of equipment is sent off site for calibration a replacement will be hired or purchased in advance.

6.1 Responsible Persons

Responsible persons are detailed within Annex E. All site personnel are responsible for immediately reporting odour problems to the Site Manager or managing director.

6.2 Meteorological Conditions

Meteorological forecasts and conditions shall be monitored to enable potential odour problems to be predicted and, if necessary, remedial actions, such as modifications to the method of working or the use of abatement techniques to be implemented. Meteorological data will be recorded as per Table 5.1.

Table 6.1: Meteorological Monitoring

Monitoring Requirements	Frequency
Observed and recorded description of conditions: precipitation, drizzle, rain, sleet, snow, temperature, winds etc.	Recorded daily
Wind speed and direction	Recorded continuously

6.3 Olfactory ('Sniff Test') Monitoring

Odour shall be monitored daily at points around the site boundary and observations shall be noted in the site diary and/or on a daily monitoring document. Surveys shall be carried out in accordance with the monitoring protocol contained within the Environment Agency's Technical Guidance Note H4.

The odour assessor may not be subject to significant odour in the 30 minutes prior to the assessment and shall be compliant with the requirements laid down in the Olfactory Survey procedure (detailed in Annex C). This is to ensure that monitors are not suffering from odour fatigue and will be sensitive to site odours.

If odour is detected and is judged to be moderate (Odour Intensity Rank 3) then the Managing Director (or Site Manager) will be notified immediately and the olfactory survey will continue to attempt to determine the scope and extent of the odour plume, as follows:

- A suitable location downwind of the site and potentially sensitive receptor at which the odour plume is unlikely to extend will be selected for assessment;
- Survey will continue toward the facility until a site-related odour is perceived; and
- Assessment points perpendicular to the plume axis and equidistant from the site will then be monitored, subject to access requirements.

Monitoring frequencies shall be as detailed in Table 6.2.

Table 6.2: Monitoring Frequencies

Parameter	Monitoring Technique	Frequency
Meteorology	See Table 6.1	
Odour	Olfactory monitoring	Daily site and perimeter checks. Increased frequency in response to complaints.
	Complaint monitoring	Continuous
Complaints	Corrective action monitoring	Post-implementation of a corrective action

6.4 Odour Monitoring

Odour monitoring is conducted at frequencies detailed in Table 6.2 by a competent person.

Distances and locations of off-site monitoring points will vary in accordance with the meteorological conditions (i.e. depending on the specific wind speed and direction at the time of monitoring).

The main aim of monitoring will be to test if any odours emitted from the site will be causing the nearest receptors nuisance. In scenarios where nuisance is being caused then operations can be suspended until the conditions improve, also the site manager may deem it necessary to find the precise source of the odour and attempt to eliminate it or neutralise it immediately.

6.5 Complaint & Corrective Action Monitoring

Complaints[1] shall be recorded and include: date and time, nature of complaint, name of complainant (if given), a summary of investigation and actions taken and their results.

[1] Operators may receive complaints (immediate or delayed) directly from community members, or indirectly from the Environment Agency or a Local Authority.

In the event of a complaint, further olfactory monitoring will be undertaken. The monitoring protocol below is adapted for the site from the Environment Agency guidance document for the regulation of odour at waste management facilities.

The odour assessor shall undertake odour observations at the location of the complaint and at potentially sensitive receptor locations downwind from the site. At each location observations shall be made concerning odour intensity, persistence and character. Details will be logged following the instruction provided in the reporting form (see Annex D) which addresses the following issues:

- Control of Pyrolysis and AD process (i.e. are anaerobic conditions being maintained)?
- Adequacy of containment / treatment measures?
- Adequate dispersion (i.e. are meteorological conditions suitable for dispersion? What mitigatory measures were applied?).

The above process shall be repeated upon completion of a corrective action (implemented as a result of an odour issue being identified).

Monitoring shall additionally endeavour to identify the scope and extent of the odour plume as described in Section 6.3.

6.6 Records

Daily records shall be maintained and include the following details:

- Results of inspections and olfactory monitoring carried out by site personnel;
- Weather conditions including wind speed and wind direction;
- Operational problems including date, time, duration, prevailing weather conditions and cause of problem;
- Complaints received including address of complainant (if available);
- Details of corrective action taken, and any subsequent changes to operational procedures; and
- An evaluation of the effectiveness of control and abatement techniques used.

7 Compliance Action Plans

7.1 Control & Trigger Levels

Control trigger levels are presented below in Table 7.1.

Table 7.1: Control & Trigger Levels

Parameter	Monitoring Technique	Control Levels
Odour	Routine olfactory monitoring	Odour Intensity 3 recorded at sensitive receptor (persistent / transient nature noted and considered)
	Complaint monitoring	Receipt of complaint

7.2 Compliance Actions

Exceedance of the control levels in Table 7.1 will necessitate further investigation into the causes and indicate whether further monitoring is required. Actions to be taken in the event of an exceedance will be dictated by the nature and extent of the exceedance(s) (e.g. by considering the magnitude of exceedance and whether it was event driven or on-going).

7.3 Response to Complaints

Receipt of an odour complaint during normal operations is treated as an exceedance of control levels. The primary response will be as detailed in accordance with the site's complaints procedure. An investigation shall be initiated into the cause of the complaint, this will involve as necessary:

- An olfactory survey following the procedure detailed in Section 6.3;
- An examination of the site activities at the time of the complaint;
- An examination of the meteorological conditions at the time of the complaint; and
- A review of the effectiveness of operational and odour control procedures.

If the complaint is validated it will be treated as an exceedance of the control level. The outcome of the investigation will determine the corrective actions to be implemented (see Section 5.5 below).

7.4 Detection of Moderate Odour During Olfactory Survey

Detection of a moderate odour, (i.e. 'odour easily detected while walking and breathing normally, possibly malodorous), will initiate a more extensive olfactory survey to determine the extent of the odour plume (as described in Section 5.3). An investigation will be initiated into the cause of the odour. This shall involve as necessary:

- A review of the site activities at the time of the olfactory survey;
- A review of the meteorological conditions at the time of the olfactory survey; and

- A review of the effectiveness of process operations and odour control procedures.

7.5 Corrective Actions

The outcome of an investigation will determine the corrective actions to be implemented, they will consider, but not be limited to:

- Alteration to waste reception procedures and odour control measures employed;
- Time / temperature parameters under which AD should be carried out;;
- Review of biogas treatment and chemical injection systems; and
- Update of OMP if new procedures are created.

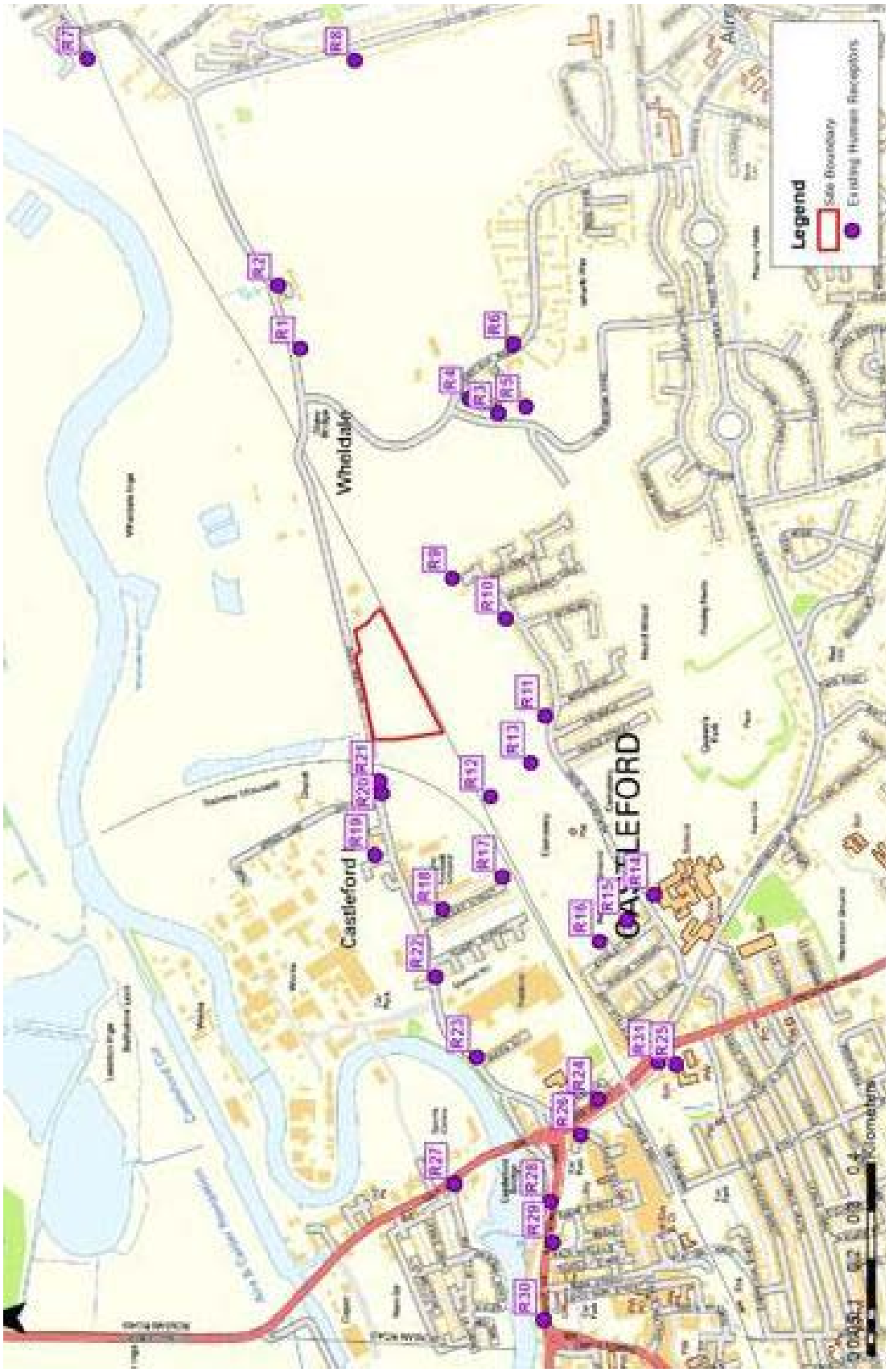
7.6 Reporting

Exceedance of a control level will be investigated (as described above) and recorded. This includes recording the following:

- Nature of the incident;
- Date of occurrence(s);
- Results of the investigation;
- Details of responses/ action plans implemented; and
- The event will be marked within the site's incident log.
  The report of any exceedance will be made available to the Environment Agency on a quarterly basis.

Annex A1: BUILDING ODOUR CONTROL MEASURES ILLUSTRATED AND TECHNICAL DETAILS

Annex A2: POTENTIAL ODOUR RECEPTORS


Legend
Site Boundary
Existing Human Receptors
Wheldale
Castleford
CASTLEFORD
R1
R2
R3
R4
R5
R6
R7
R8
R9
R10
R11
R12
R13
R14
R15
R16
R17
R18
R19
R20
R21
R22
R23
R24
R25
R26
R27
R28
R29
R30
R31

Annex B: FAILURE & ABNORMAL EVENT SUMMARY TABLE

Table B: Failure and Abnormal Event Summary					
Odour Generating Process	Release Points	Abnormal Situation / Failure	Potential Outcome	Control Measure	Action (Resp)
Reception, Screening etc	Reception area	Extended duration of stable meteorological conditions	Elevated odour concentrations at receptors	Weather forecast, manage reception in response to wind/weather conditions. Olfactory survey and complaint monitoring	Progressive initiation of control measures as necessary and compliant investigation in accordance with Section 6.3 (Site Manager).
Air Emissions from Waste-to-Energy Process	Stack A1	Failure of thermal oxidiser and extraction system	WID Non-compliance. Elevated odour concentrations at receptors.	Monitor odour level. Shut down WTE plant until thermal oxidiser is repaired and fully operational.	Access reason for failure and amend procedures as necessary (Site Manager).
Damage to building	Building Fabric	Damage to sealing systems preventing negative pressure operation	Odour release	Immediate temporary repair of building fabric	Replacement of panelling section
Build up of wastes within reception areas causing odour	Doors (potentially)	Failure of conveyor systems and autoclave plant	Odour release	Immediate repair of conveyor – critical spares are stored on site	Replacement of key conveyor components.
Failure of AD Odour Control Devices	Engine Stacks	Hydrogen sulphide builld up in tanks.	Odour release from stacks	Oxygen and pH levels continuously monitored in AD tanks. All plant continuously monitored	Plant Engineering Team.

Annex C: EXAMPLE OLFACTORY ASSESSMENT FORM

OLFACTORY SURVEY ASSESSMENT REPORT		
Name of Assessor:		
Reference Table 1* - Confirmation (signature) *confirmation that conditions of Reference Table 1 are met		
Survey Timings	Date	
	Start Time	
	Finish	
Location of complaint (if relevant)		
Wind Direction		
Wind Velocity (m/s)		
Cloud Cover (%)		
Temperature **(°C)**		
Precipitation		

Location [1]	Odour Intensity [2]	Odour Extent [3]	Odour Description [4]	Receptor Sensitivity [5]

Sketch

Provide a sketch of test and source locations

[1]Include compliant location first (if relevant)
[2]Refer to Reference Table 2
[3]Refer to Reference Table 3
[4]Describe the character of the odour (e.g. rotten eggs, musty, earthy, drains etc)
[5]Refer to Reference Table 5

Notes;

If odour intensity is judged as 3 or above at a sensitive receptor location the Site Manager must be immediately notified

The extent of the plume should be investigated as follows:

Choose a suitable location downwind of the compositing facility and sensitive receptor at which the odour plume is unlikely to extent. Continue toward the site until a faint odour is detectable.

Select further assessment points at right angles to the plume axis and equidistant from the facility to determine extent of plume.

REFERENCE TABLE 1
Requirements for Assessor
Assessor has not been exposed to odours for previous 30 minutes
Assessor has not smoked or consumed strongly flavoured food or drink in previous 30 minutes
Scented toiletries should not be applied immediately before or during assessment.
Vehicle used for assessment should not contain deodoriser and care should be taken concerning odour in windscreen wash.

REFERENCE TABLE 2	
Odour Intensity	Description
1	No detectable odour
2	Faint odour (barely detectable, need to stand still and inhale facing into wind.
3	Moderate odour (odour easily detectable while walking and breathing normally, possibly offensive)
4	Strong odour (bearable, but offensive odour – will my clothes hair/smell?)
5	Very strong odour (malodorous)

REFERENCE TABLE 3	
Odour Extent	Description
1	Local and transient (only detected during brief periods when wind drops or blows)
2	Transient as above, but detected away from site boundary
3	Persistent but fairly localised
4	Persistent and pervasive up to 50m from site boundary
5	Persistent and widespread (odour detected > 50m from site boundary

REFERENCE TABLE 4	
Receptor Sensitivity	Description
1	Low (e.g. footpath, road)
2	Medium (e.g. industrial or commercial workplaces)
3	High (e.g. housing, pub/hotel etc)

Annex D: ODOUR COMPLAINT REPORT FORMS

ODOUR COMPLAINT REPORT FORM	
Time and date of complaint:	
Name and address of complainant:	
Telephone number of complainant:	

Date of odour:	
Time of odour:	
Location of odour, if not at above address:	
Weather conditions (i.e., dry, rain, fog, snow):	
Temperature (very warm, warm, mild, cold or degrees if known):	
Wind strength (none, light, steady, strong, gusting):	
Wind direction (e.g. from NE):	
Complainant's description of odour: o What does it smell like?	
o Intensity (see Reference Table 1):	
o Duration (time):	
o Constant or intermittent in this period:	
o Does the complainant have any other comments about the odour?	
Are there any other complaints relating to the installation, or to that location? (either previously or relating to the same exposure):	
Any other relevant information:	
Do you accept that odour likely to be from your activities?	
What was happening on site at the time the odour occurred?	
Operating conditions at time the odour occurred (e.g. flow rate, pressure at inlet and pressure at outlet):	
Actions taken:	

Form completed by:	Date:	Signed;

Odour Intensity	Description
1	No detectable odour
2	Faint odour (barely detectable, need to stand still and inhale facing into wind.
3	Moderate odour (odour easily detectable while walking and breathing normally, possibly offensive)
4	Strong odour (bearable, but offensive odour – will my clothes hair/smell?)
5	Very strong odour (malodorous)

Annex E: RESPONSIBLE PERSONS

Table C1: Responsible Persons		
Control Measure	Responsible Persons	
	Implementation on-site	Overall Manager
Receipt of waste and off-loading In accordance with Section 3.1.		
Autoclaving, Pyrolysis & Syngas combustion In accordance with Section 3.2/3.3		
Digestion & Storage In accordance with Section 3.4		
Treatment of Biogas In accordance with Section 3.5		
Meteorological monitoring In accordance with Section 6.2		
Olfactory Surveys In accordance with Section 6.3		
Complaint monitoring In accordance with Section 6.5		

Overall Responsibility and Authority:

DATE: December 2013	**REVISION:** 1	**DOC #: CPP-SWP**

CLEAN POWER

PROPERTIES

SITE WORKING PLAN

Table of Contents

1. Introduction 3

2. Site Process Description 4

3. Environmental Setting 12

4. Site Infrastructure 13

5. Technical Competence and Training 16

1. INTRODUCTION

1.1. Clean Power Properties Ltd existing site is located at Wheldon Road, Castleford (referred to hereafter as 'the installation'). The proposed development will comprise of an energy recovery centre comprising of an Advanced Conversion Technology plant and an Anaerobic Digestion plant.

1.2. The installation will receive non-hazardous mixed source waste and food waste from licensed and local authority permitted operators (See Section 2.3) and processes them to form the following primary products;

- Biofuel – biomass fuel produced during the autoclaving process and combusted in the pyrolysis units;
- Syngas – synthetic gas produced from combustion of the biofuel within the pyrolysis units, the syngas is then combusted within gas engines in order to produce renewable electricity and heat; and
- Recyclates – recovered during the autoclaving and mechanical separation process and shipped off-site for re-use.
- Biogas – biogas produced during the anaerobic process and combusted within gas engines in order to produce renewable electricity and heat;
- Solid Digestate – produced during anaerobic digestion and spread on neighbouring farmland as a fertiliser, the digestate shall be PAS 110 compliant[1]

1.3. This document forms the working plan and has been prepared in accordance with the following requirements:

- Environmental Permitting Regulations 2010; and
- Site Waste Management Licence / Environmental Permit *(EA Reference to be filled in once permit is issued)*.

1.4. This working plan has been prepared to provide an account of the operational practices and environmental considerations for the reception, handling and processing of mixed source waste ('MSW') and non-hazardous food waste and energy production processes carried out by Clean Power (UK) Ltd.

1.5. A sign which provides the necessary site and operations information is positioned at the entrance to the site. The sign provides all the necessary site information, contact details and relevant waste codes as required by the site Environmental Permit.

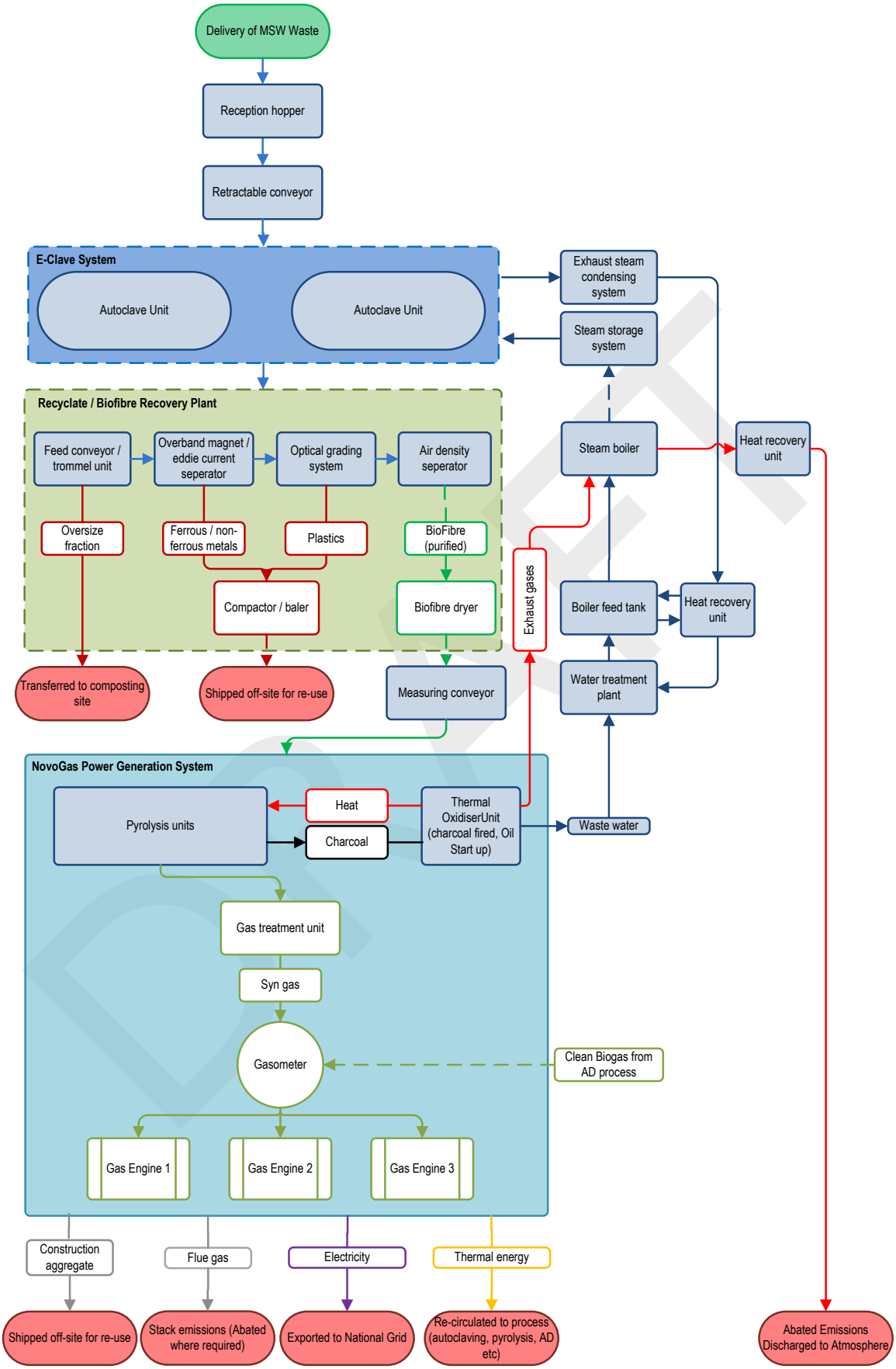
1.6. A copy of the Environmental Permit and the working plan will be kept in the site office at all times.

[1] PAS 110:2010 Specification for whole digestate, separated liquor and separated fibre derived from the anaerobic digestion of source-segregated biodegradable materials. Certification against PAS 110 allows all digestate produced on-site to meet EU 'End of Waste' criteria.

2. SITE PROCESS DESCRIPTION

2.1. Process Schematic

Figure 2.1 and Figure 2.2 provide a broad overview of the process flow through the facility. Further detail of each stage is provided within each of the specific working procedures in use at the sites and within the further sections of this working plan.


Delivery of MSW Waste
Reception hopper
Retractable conveyor
E-Clave System
Autoclave Unit
Autoclave Unit
Exhaust steam condensing system
Steam storage system
Recyclate / Biofibre Recovery Plant
Feed conveyor / trommel unit
Overband magnet / eddie current seperator
Optical grading system
Air density seperator
Oversize fraction
Ferrous / non-ferrous metals
Plastics
BioFibre (purified)
Compactor / baler
Biofibre dryer
Steam boiler
Heat recovery unit
Exhaust gases
Boiler feed tank
Heat recovery unit
Water treatment plant
Transferred to composting site
Shipped off-site for re-use
Measuring conveyor
NovoGas Power Generation System
Pyrolysis units
Heat
Charcoal
Thermal OxidiserUnit (charcoal fired, Oil Start up)
Waste water
Gas treatment unit
Syn gas
Gasometer
Clean Biogas from AD process
Gas Engine 1
Gas Engine 2
Gas Engine 3
Construction aggregate
Flue gas
Electricity
Thermal energy
Shipped off-site for re-use
Stack emissions (Abated where required)
Exported to National Grid
Re-circulated to process (autoclaving, pyrolysis, AD etc)
Abated Emissions Discharged to Atmosphere

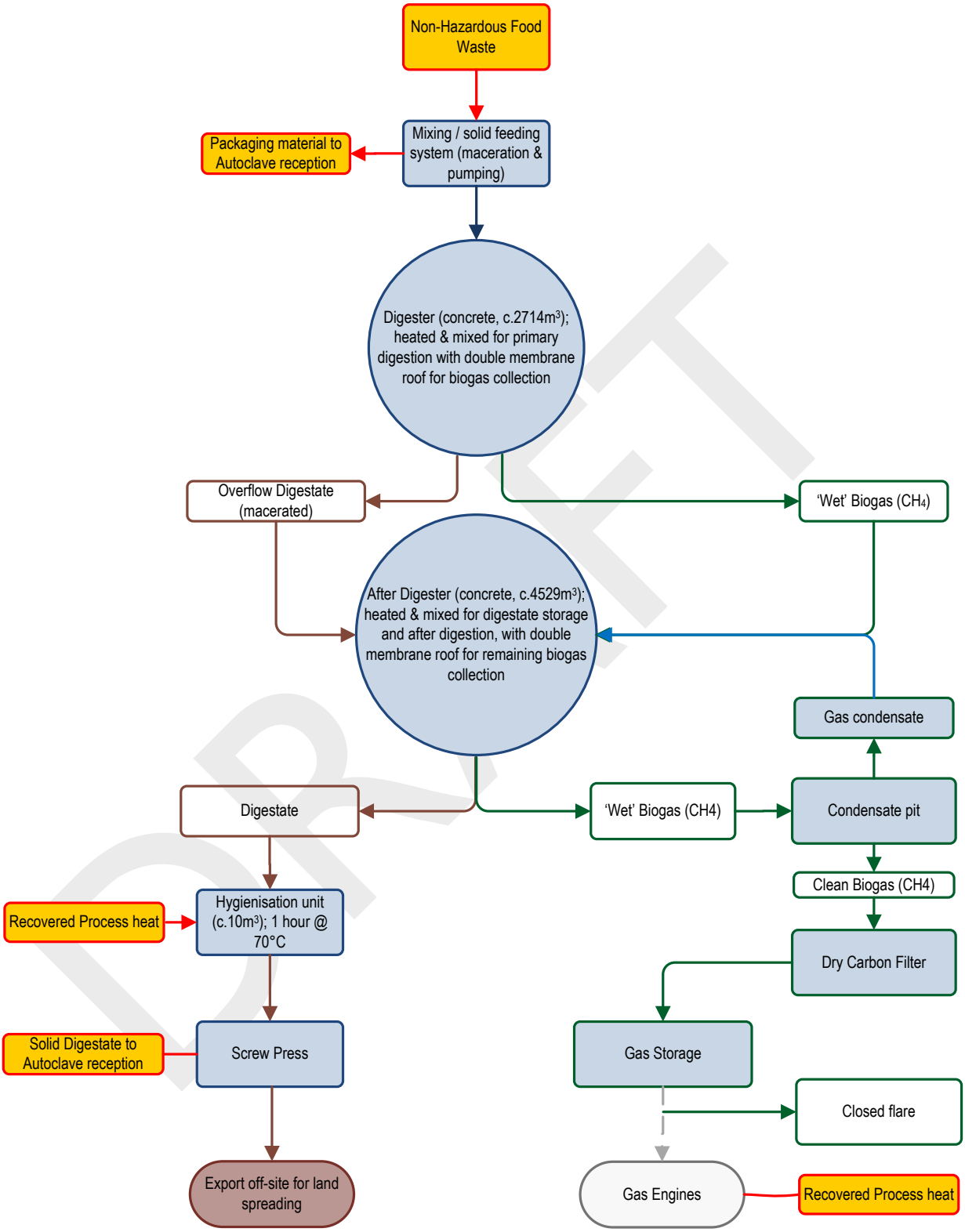


Fig 2.2: Anaerobic Digestion Process Schematic

2.2. Site Layout

The schematic below (Figure 2.3) provides an over view of the layout of the installation indicating the location of the key plant and equipment, plant and process areas.

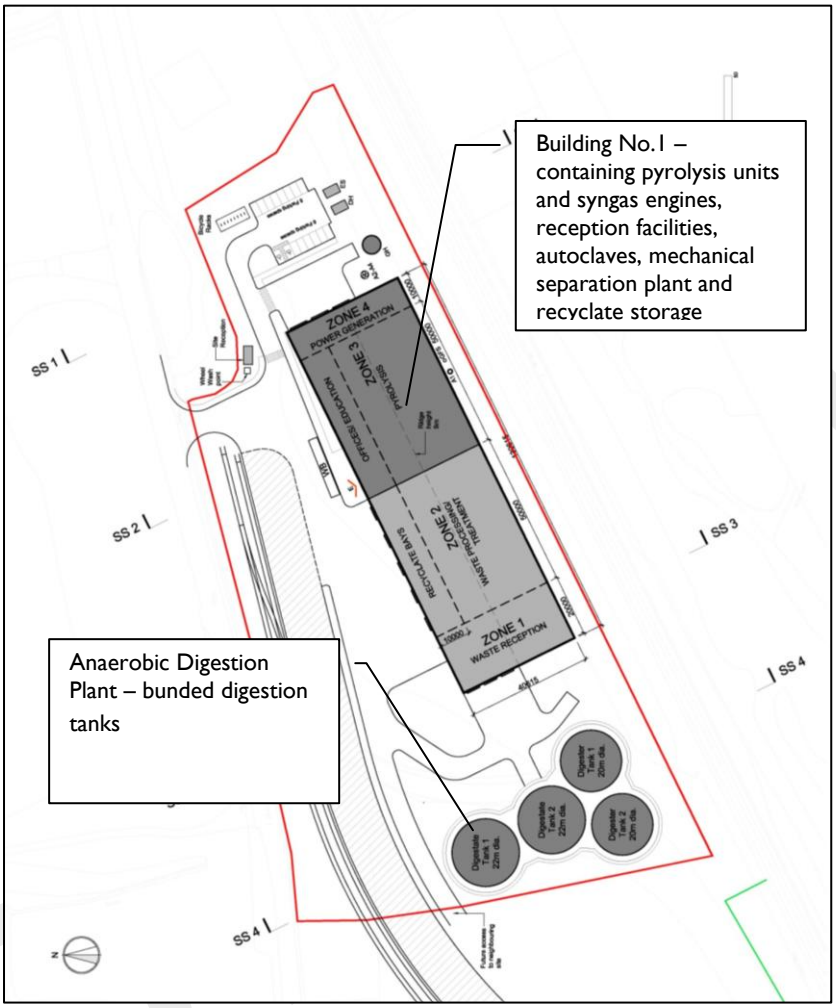


Figure 2.3 Site Layout showing process locations

The site covers an area of approximately 2.4ha.

2.3. Specified Waste Management Activities

The wastes accepted onto site comprise mixed source waste and green waste comprising the following waste types (and approximate proportions):

- Biomass / organic fraction (70%);
- Plastics (14%);
- Ferrous metals (6%);
- Non ferrous metals (3%);
- Textiles (2%);
- Glass (2%); and
- Other (2%).

Waste Management Operations can be represented diagrammatically in Figure 2.4 below according to Table 2.1 below.

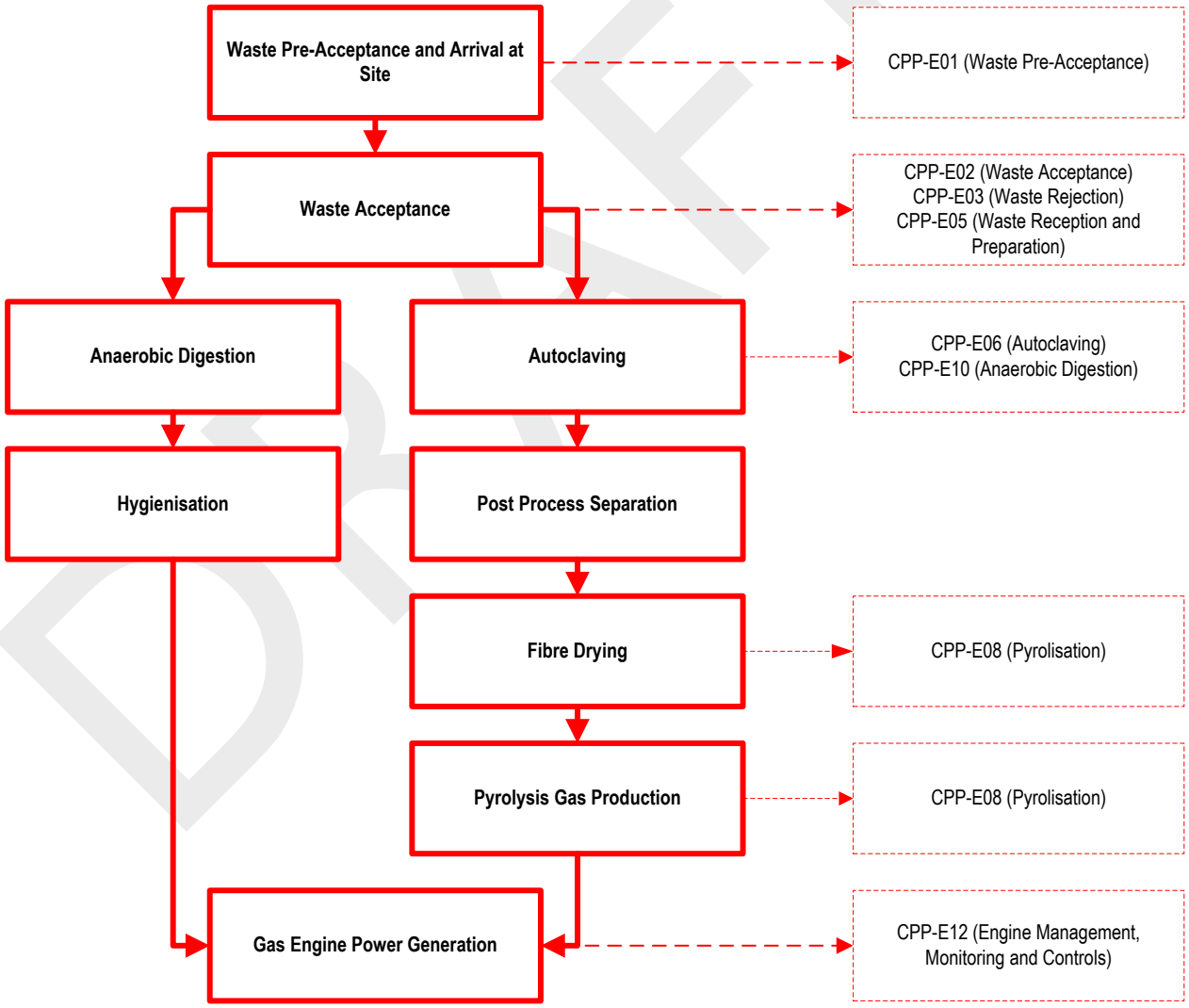


Figure 2.4 Site Layout showing process locations

Associated procedures for the above site processes are summarised within Table 2.1.

Table 2.1; SWP Procedure & Guidance Map		
Reference No:	**Title**	**Purpose**
CPP-E01	Waste Pre-Acceptance	This procedure defines the upstream screening, checking and pre-acceptance of all incoming waste prior to its arrival on site.
CPP-E02	Waste Acceptance	This procedure outlines the onsite controls and considerations that need to be applied when waste materials arrive on site for processing.
CPP-E03	Waste Rejection	This procedure outlines the waste rejection process for all non-conforming wastes that cannot be processed on site. Acceptance of non-conforming wastes will be a direct breach of the permitted conditions of the sites Environmental Permit.
CPP-E04	Off Site Waste Transfers	This procedure provides the necessary information to enable the assessment and off site transfer of non-conforming or untreatable waste streams.
CPP-E05	Waste Reception and Preparation	This procedure outlines the waste reception, storage and autoclave/anaerobic digestion loading processes for all incoming waste.
CPP-E06	Autoclaving	This procedure defines the processes and stages of the autoclaving processes
CPP-07	Recyclate management	This procedure defines the recyclate management and control process.
CPP-E08	Pyrolisation	This procedure defines the stages and control measures for the pyrolisation syngas generation process
CPP-E09	Slag and Ash management	This procedure defines the condensate management and control process.
CPP-E10	Anaerobic Digestion	This procedure defines the stages and control measures for the anaerobic digestion process
CPP-E11	Digestate Management	This procedure defines the digestate management and control process
CPP-E12	Engine management, Engineering and Controls	Procedure that outlines the required monitoring and analysis requirements for the operation of the gas engine generation sets, pasteurisation and digestion stages
CPP-E13	Environmental Records	This procedure defines the necessary Environmental Permit and Waste Records that are required to be managed by the site to ensure compliance.
CPP-E14	Environmental Monitoring and Management Programme	This procedure provides an overview of all of the necessary environmental monitoring, management procedures and controls to ensure compliance with the Site Environmental Permit.
CPP-E15	Infrastructure Monitoring and Cleaning Programme	This procedure provides an outline of the inspection and cleaning requirements for the site.
CPP-E16	Accident Management Plan	This procedures refers to the sites Emergency Plans and response requirements
CPP-E17	Odour Management Plan	This document outlines the sites Odour Management plan and requirements

Table 2.1; SWP Procedure & Guidance Map		
Reference No:	**Title**	**Purpose**
CPP-E18	Training	To ensure that all training needs are identified for a relevant personnel. In addition, educational and training qualifications and records are maintained
CPP-E19	Security	To ensure that all site and driver security controls are implemented and maintained to minimise security risks at Clean Power Properties.
CPP-E20	Emergency Procedures	To ensure the safe evacuation of the site and protection of the environment in the event of a site emergency.

The following associated procedures are appended to this document:

- CPP-E01 – Pre-acceptance;
- CPP-E02 – Waste Acceptance;
- CPP-E03 – Waste Rejection;
- CPP-E04 – Off Site Waste Transfer;
- CPP-E05 – Waste Reception;
- CPP-E06 – Autoclaving;
- CPP-E10 – Anaerobic Digestion

Incoming waste will be received in accordance as marked within Figures 2.1, 2.2 and 2.4 and within the individual site procedures. Waste material deemed suitable for autoclaving will be retained and processed as appropriate.

2.4. Waste processing

All waste arriving on-site will be processed through autoclaving, pyrolysis and anaerobic digestion activities, the key stages of which are summarised below (detailed process descriptions are contained within the relevant procedures highlighted in Table 2.1 and Figure 2.4):

- **Pre-acceptance / Acceptance:** Notification of consignment and inspection of waste deliveries in order to ensure compliance with site permitting requirements;

- **Preparation:** Preparation (automated loading into 'E-Clave' units) within the building shown as the 'Zone 1' in Figure 2.3;

  Zone 2 contains the inspection pit, 2 E-Claves (autoclave units), mechanical separation equipment, proprietary 'Biofibre' drying equipment and recyclate storage bays.

- **Autoclaving:** Steam treatment ('pressure cooking'), conditioning, reduction and sanitisation of waste. Reduction of waste volume by 80%.

- **Post-Treatment Separation:** Screening and mechanical separation of BioFibe from recyclates. Temporary storage of recyclates prior to re-use off-site.

- **Biomass Fibre Treatment and Pyrolysis:** Drying of Biomass Fibre within a proprietary unit and combustion within the pyrolysis units (within Zone 3) in order to produce synthetic gas ('syngas') which is temporarily stored within dedicated gasometers.

Zone 3 contains 4 pyrolysis units and 3 gas engines.

- **Anaerobic Digestion:** Four digestate tanks produce biogas which is combusted in the CHP plant and solid digestate which is reprocessed through the autoclave unit. Any liquid digestate produced is transported off site.

- **Power Generation by Gas Engine Generators:** Combustion of the syngas/biogas within specially-configured gas engines and subsequent production of electricity and thermal energy.

2.5. Site Management

All day to day management issues are the responsibility of the Site Manager, who holds the title of Competent Person, as defined by WAMITAB's and the Environment Agency's Operator Competence Scheme. Each treatment and storage vessel on-site is clearly labelled in correspondence with the processes described in this working plan.

3. Environmental Setting

3.1. Geology and Hydrogeology

According to the relevant British Geological Survey (BGS) Solid and Drift Geology Map of the area (Sheet 78: Wakefield) and the BGS Geology of Britain Viewer the site is directly underlain by the Pennine Middle Coal Measures Formation. The site is not underlain by superficial deposits.

The site is considered to be situated in an area moderate sensitivity with respect to groundwater resources due to the underlying Secondary A Aquifer. This sensitivity is mitigated somewhat by the absence of any groundwater abstractions within a 500m search radius of the Site and that the site is not situated in a groundwater source protection zone.

3.2. Surface Water Features

There are no surface water features located on site.

The nearest surface water body is the River Aire which is located approximately 450m to the west of the site at its closest point.

3.3. Sensitive Environmental Receptors

According to the EA website, the site does not lie within a Groundwater Source Protection Zone.

There are no groundwater abstraction licenses associated with the site. However, there are eight licensed groundwater abstractions recorded within 1km of the site. The closest of which is located approximately 660m to the south-west of the site which allows the abstraction of groundwater for general cooling and general usage.

There are no surface water abstraction licenses associated with the site. However, there are eight surface water abstractions within 1km of the site. The nearest of which is located approximately 411m to the north of the site and relates to the usage of water for dust suppressions.

There are no Special Areas of Conservation, Special Protection Areas or Ramsar Sites within 10km of the subject site. However, approximately 500m to the north of the site is the Fairburn and Newton Ings SSSI/LNR.

Based on the above, the installation is not likely to have any significant environmental effects due to the limited nature of emissions and the number of potentially sensitive receptors within the proximity of the installation.

4. SITE INFRASTRUCTURE

4.1. Building Design and Layout

The Waste Management and Energy Generation facility incorporates the construction of a new building to accommodate the Energy Recovery Centre.

The main building will comprise a single impermeable technically engineered portal framed structure 130m by 40m, at a height of 9m (to the ridge).

The building will be constructed with a proprietary curtain wall cladding system designed to ensure adequate air-tightness, acoustic and thermal performance.

The main building will house approximately 400m2 of internal offices, meeting rooms and visitor education areas.

All aspects of the internal office areas have been designed to ensure complaint access in accordance to the requirements of the Disability and the Equality Act 2010 (DDA)2.

The building will be subdivided internally to house the separate processes and be zoned to comply with relevant industrial safety regulation i.e. gas safety regulations, explosive atmospheres etc.

The south facing elevation of the main building roof will incorporate approximately 250m2 of solar photovoltaic panels.

There will be a stack associated with the pyrolysis plant, which will be approximately 25m in height and a maximum of 250m in diameter.

Each engine will have a single exhaust stack 100cm in diameter which exits through the building to a height of 25m, all grouped together to appear as a single exhaust stack.

The building will comprise of four dedicated zones, namely Zone 1 (Waste Reception), Zone 2 (Waste Processing/Treatment), Zone 3 (Pyrolysis) and Zone 4 (Power Generation) and contains the following equipment:

- Inspection pits and automated hoppers / in-feed conveyors for the loading of waste into the E-claves;
- Two (2) E-Clave units and an ancillary steam boiler system for the steam treatment of incoming waste;
- Mechanical separation equipment (including a trammel unit, overband magnet / eddie current separator, optical grading system, and a baler / compactor) for the post-treatment separation of recyclates;
- Water treatment and steam storage system (including a boiler feed tank, carbon filters, a steam accumulator, condensing system, heat recovery unit and external cooling towers) for the storage and provision of recovered steam to the E-Clave units;
- Biofibre dryer and air density separator for the pre-treatment of Biomass Fibre prior to pyrolysis in Zone 3).
- Four pyrolysis units (and associated vortex heating units) for the production of syngas from combustion of Biomass Fibre;

[2] From 1 October 2010, the Equality Act replaced most of the Disability Discrimination Act (DDA). However, the Disability Equality Duty in the DDA continues to apply.

- Three cogeneration (CHP) units (each with a 4MWe output) for the combustion of syngas produced from the pyrolysis process and subsequent production of electricity and heat; and
- One external thermal oxidiser unit (and associated exhaust stack, 25m in height) for the abatement of emissions from the pyrolysis.
- Each engine is equipped with its own stack.

All operational plant within the building will be checked weekly by the Site Manager as part of a planned preventive maintenance programme.

A number of ancillary structures will be located adjacent to the waste reception and pyrolysis building, including; a small gasometer (c. 6m (d) x 9m (h)), a cooling plant and a static pressurised nitrogen cyclinder.

Two small buildings of approximately 5m by 3m at a height of 3m will house the electricity sub-station and district heating connection and metering equipment serving the facility.

A small security/gatehouse building will be located adjacent to the site access and exit.

The site will also be fitted with 2 x AD digester tanks (25m dia) and 2 x AD disgestate tanks (30m dia). The tanks are fitted externally and extend to a height of 9.5m.

4.2. Drainage System

4.2.1. Contaminated Surface Water Runoff

The drainage system for internal and external areas is inspected weekly and maintained. All areas are hard-surfaced and surface water run-off is contained and discharged to holding tanks.

The site manager is responsible for the organisation of the cleaning of all building gutters, gullies, drains and storage tanks at appropriate intervals.

4.2.2. Uncontaminated Surface Water / Roof water Runoff

Clean precipitation runoff from the roof building units will be collected and directed to controlled waters.

4.3. Site Security

The relevant security measures will include;

- A perimeter fence which is inspected periodically to ensure that the site security has not been compromised.

- A gatehouse controlling the sole access point to the installation. This gatehouse will be manned from 0800hrs until 1800hrs during site operation and which is alarmed and monitored between 18:00 – 08:00hrs.

- CCTV monitoring of the external and internal areas of the Installation.
- External on-line monitoring and administration of the waste-to-energy process from a remote location.
- Heavy duty roller shutter doors for overnight site security.
- All personnel and vehicles entering the site are strictly controlled and managed; no vehicles or personnel will be allowed access to the facility without prior authorisation.

A copy of the site security plan will be stored at the Gatehouse.

4.4. Infrastructure Monitoring

The infrastructure monitoring of the site will take place in accordance with procedure CPP-E15 Infrastructure Monitoring and Cleaning Programme.

5. TECHNICAL COMPETENCE & TRAINING

The Manager is defined as the Technically Competent Person for the site. The site manager holds all necessary qualifications to be defined as 'Technically Competent' as defined by the Environment Agency Operator Competence Scheme and WAMITAB Certificate of Technical Competence Schemes.

All personnel on site have been trained in the site operation procedures and Working Plan according to table 5.1 below.

The site manager is responsible for insuring that all operators and personnel receive training as required.

Table 5.1; Training Summary

	Site Working Plan Manual CPP-SWP	Waste Pre Acceptance CPP-E01	Waste Acceptance CPP-E02	Waste Rejection CPP-E03	Off site Waste Transfers CPP-E04	Waste Reception and Preparation CPP-E05	Autoclaving CPP-E06	Recyclate Management CPP-E07	Pyrolisation CPP-E08	Slag and Ash Management CPP-E09	Anaeorbic Digestion CPP-E10	Digestate Management CPP-E11	Engine Management & Controls CPP-E12	Environmental Records CPP-E13	Environmental Monitoring CPP-E14	Infrastructure Monitoring CPP-E15	Accident Management Pland CPP-E016	Odour Management Plan CPP-E17	Training CPP-E18	Security CPP-E19	Emergency Response Plan CPP-E020
Site Manager	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Weighbridge Personnel	■	■	■	■	■																■
Administration Personnel	■	■																			■
Machine Operators	■		■	■																	■
Hand Sorters / Pickers	■			■																	■
Site Management	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Visitors																					■

Appendix 1

Operating Procedures

Overview

The control of wastes and the prevention of unsuitable wastes being accepted on site is a key management requirement to ensure quality control of the processes at the waste-to-energy plant at Clean Power Properties. The uncontrolled acceptance of unsuitable or contaminated wastes can lead to adverse reactions, uncontrolled emissions or product liability issues resulting from their treatment and recovery.

This procedure defines the upstream screening of all incoming waste prior to its arrival on site.

1. Pre-acceptance process

1.1 Initial order/enquiry

Prior to the delivery of any loads, Clean Power Properties shall obtain and agree a written supply agreement for the input materials with each input material supplier. The written agreement shall provide the following;

- The waste type and specific source location(s) of the material;
- A brief description of the source type, physical form and the specific process producing the waste (usually defined by SIC Code);
- Details of the suppliers quality management system and a statement from the supplier confirming their duty of care and commitment to quality control (consistency of waste type, source, presence of hazards within the materials etc);
- European Waste Catalogue (EWC) code.

Such information shall be obtained by issuing a "Producer Declaration Form". This process should occur for all new waste streams introduced to site.

Under the conditions of the site environmental permit (REFERENCE TO BE INSERTED HERE) Clean Power Properties are only allowed to receive specific wastes. A list detailing all permitted waste codes is detailed in Table 1 overleaf.

1.2 Long term Supply Agreements

In the case of long-term supply arrangements with clients / suppliers, the above details are only required to be obtained once for each particular waste stream received, excepting quantity of waste which must be recorded in the Site Diary per individual load (See Section 3.3) and the relevant Duty of Care documentation (Waste Transfer Notes).

However, different waste streams from the same supplier must be accompanied with the above information should they have a different composition or be derived from a different process to previous wastes received.

The Producer Declaration Form, upon receipt, is signed by the Site Manager (and / or their delegate).

No materials will be authorised for processing without sufficient / representative sampling data.

1.3 Inadequate information

In the event of the receipt of a Producer Declaration Form with insufficient information (e.g. compositional details etc), all associated waste materials will not be accepted by Clean Power Properties Ltd under the site waste rejection procedure (CPP-E03).

Each individual Waste Stream must be allocated an individual reference number which can be re-used in future transactions.

This will allow for the technically competent person(s) to adequately prepare for acceptance / rejection of the waste (see Procedure CPP-E02) as each reference number refers to a specific waste whose characteristics (composition, individual concentrations etc) must remain the same.

The information relating to each waste stream shall be filed under its individual reference number on the producer declaration form, detailing the information above and stored in the site office.

Table 1: Accepted Waste Materials
02 WASTES FROM AGRICULTURE, HORTICULTURE, AQUACULTURE, FORESTRY, HUNTING AND FISHING, FOOD PREPARATION AND PROCESSING
02 01 wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing
02 01 03 plant-tissue waste
02 01 04 waste plastics (except packaging)
02 01 07 waste from forestry
02 0110 waste metal
02 02 wastes from the preparation and processing of meat, fish and other foods of animal origin
02 02 02 animal-tissue waste
02 02 03 materials unsuitable for consumption or processing
02 03 wastes from fruit, vegetables, cereals, edible oils, cocoa, coffee, tea and tobacco preparation and processing; conserve production; yeast and yeast extract production, molasses preparation and fermentation
02 03 04 materials unsuitable for consumption or processing
02 05 wastes from the dairy products industry
02 05 01 materials unsuitable for consumption or processing
02 06 wastes from the baking and confectionery industry
02 06 01 materials unsuitable for consumption or processing
02 07 wastes from the production of alcoholic and non-alcoholic beverages (except coffee, tea and cocoa)
02 07 01 wastes from washing, cleaning and mechanical reduction of raw materials
02 07 04 materials unsuitable for consumption or processing
03 WASTES FROM WOOD PROCESSING AND THE PRODUCTION OF PANELS AND FURITURE, PULP, PAPER AND CARDBOARD
03 01 wastes from wood processing and the production of panels and furniture
03 01 01 waste bark and cork
03 01 05 sawdust, shavings, cuttings, wood, particle board and veneer other than those mentioned in 03 01 04
03 03 wastes from pulp, paper and cardboard production and processing
03 03 01 waste bark and wood
03 03 07 mechanically separated rejects from pulping of waste paper and cardboard
03 03 08 wastes from sorting of paper and cardboard destined for recycling
03 03 10 fibre rejects, fibre-, filler-, and coating-sludges from mechanical separation
07 WASTES FROM ORGANIC CHEMICAL PROCESSES
07 02 wastes from the MFSU of plastics, synthetic rubber and man-made fibres
07 02 13 waste plastics
15 WASTE PACKAGING; ABSORBENTS, WIPING CLOTHES, FILTER MATERIALS AND PROTECTIVE CLOTHING NOT OTHERWISE SPECIFIED
15 01 packaging (including separately collected municipal packaging waste

Table 1: Accepted Waste Materials
15 01 01 paper and cardboard packaging
15 01 02 plastic packaging
15 01 03 wooden packaging
15 01 04 metallic packaging
15 01 05 composite packaging
15 01 06 mixed packaging
15 01 07 glass packaging
15 01 09 textile packaging
19 WASTES FROM WASTE MANAGEMENT FACILITIES, OFF-SITE WASTE WATER TREATMENT PLANTS AND THE PREPARATION OF WATER INTENDED FROM HUMAN CONSUMPTION AND WASTE FOR INDUSTRIAL USE
19 05 wastes from aerobic treatment of solid wastes
19 05 01 non-composted fraction of municipal and similar waste
19 05 02 non-composted fraction of animal and vegetable waste
19 05 03 off-specification compost
19 06 wastes from anaerobic treatment of waste
19 06 04 digestate from anaerobic treatment of municipal waste
19 06 06 digestate from anaerobic treatment of animal and vegetable waste
19 08 wastes from waste water treatment plants not otherwise specified
19 08 01 screening
19 08 12 sludges from biological treatment of industrial waste water other than those mentioned in 19 08 11
19 08 14 sludges from other treatment of industrial waste water other than those mentioned in 19 08 03
19 09 wastes from the preparation of water intended for human consumption or water for industrial use
19 09 01 solid waste from primary filtration and screenings
19 09 02 sludges from water clarification
19 12 wastes from the mechanical treatment of waste (for example sorting, crushing, compacting, pelletising) not otherwise specified
19 12 01 paper and cardboard
19 12 02 ferrous metal
19 12 03 non-ferrous metal
19 12 04 plastic and rubber
19 12 05 glass
19 12 07 wood other than mentioned in 19 12 06
19 12 10 combustible waste (refuse derived fuel)
19 12 12 other wastes (including mixtures of materials) from mechanical treatment of wastes other than those mentioned in 19 12 11
20 MUNICIPAL WASTES (HOUSEHOLD WASTE AND SIMULAR COMMERICAL, INDUSTRIAL AND INSTITUTIONAL WASTES). INLCUDING SEPARATELY COLLECTED FRACTIONS.
20 01 separately collected fractions (except 15 01)
20 01 01 paper and cardboard
20 01 02 glass
20 01 08 biodegradable kitchen and canteen waste
20 01 38 wood other than that mentioned in 20 01 37
20 01 39 plastics
20 01 40 metals
20 02 garden and park wastes(including cemetery waste)
20 02 01 biodegradable waste
20 02 03 other non-biodegradable waste
20 03 other municipal wastes
20 03 01 mixed municipal waste

Table 1: Accepted Waste Materials
20 03 02 waste from markets
20 03 99 municipal wastes not otherwise specified

2. Documentation and Records

All records relating to the pre-acceptance for each approved waste stream should be retained by the company secretary for a minimum of three years, or indefinitely for ongoing supply arrangements.

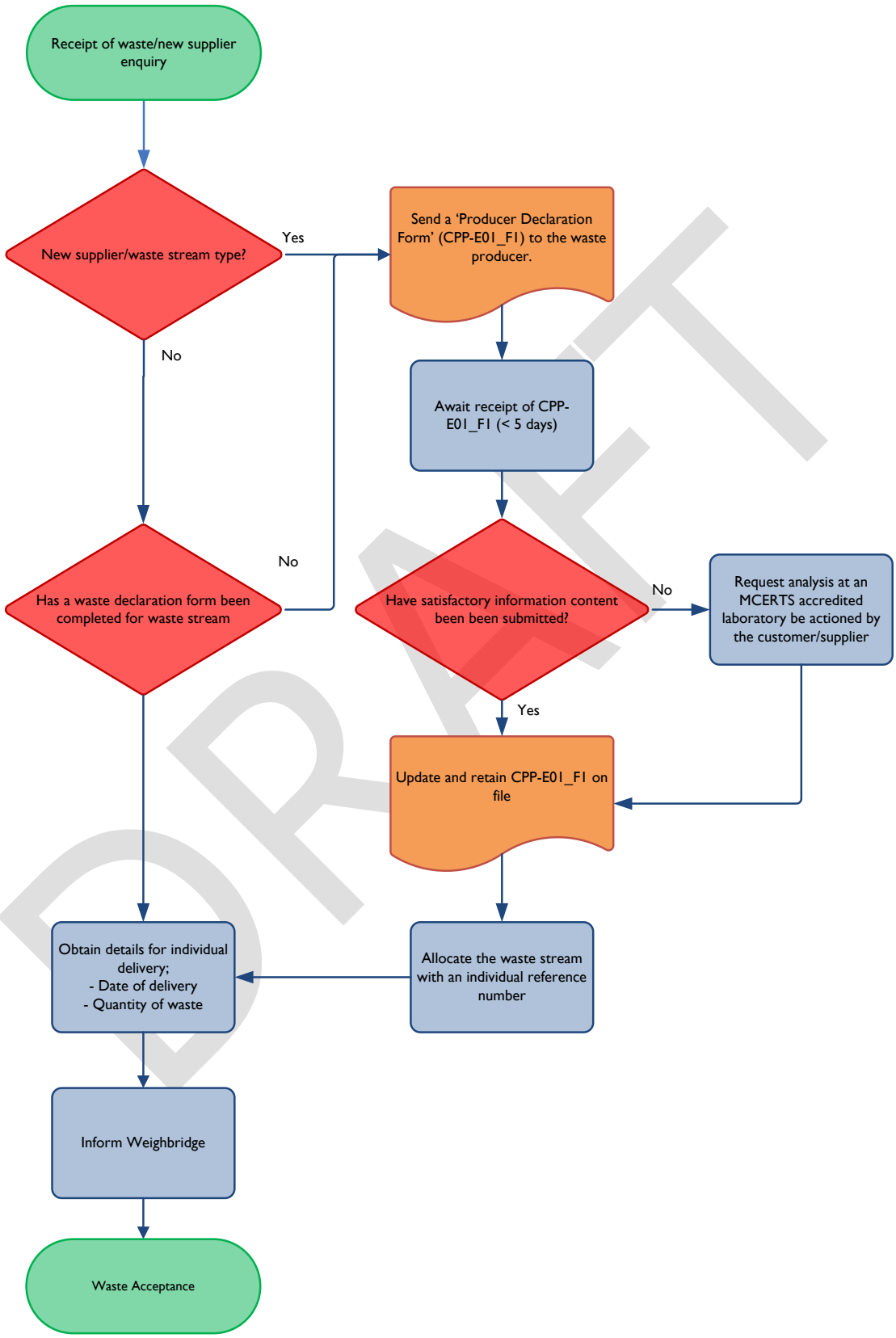
Hardcopies of the transferred waste will be kept in the site office as well as electronic files on the company computer system and will be available for inspection on request.

Each approved waste stream shall be documented under its individual reference number with the information detailed in Section 3.1.

Table 2.1; Internal record retention

Record	Retained by	Location	Hardcopy (✓/✗)	Electronic (✓/✗)	Retention Period
Form CPP-E01_F1	Site Manager	Site Office	✓	✓	3 years
Correspondence with EA/Consignors	Site Manager	Site Office	✓	✓	3 years

3. Process flow chart: CPP-E01 Pre-Acceptance



4. Training Record

The below signatories have received training and understand all aspects of procedure CPP-E01.

Table 4.1: Training

PRINT EMPLOYEE NAME	EMPLOYEE SIGNATURE	DATE	MANAGER INITIALS	UN-CONTROLLED COPY ISSUED (✓)

Overview

The control and acceptance of wastes when they arrive at site is a key process in avoiding potential contribution to system inefficiency through introduction of unsuitable waste streams.

This procedure outlines the onsite controls and considerations that need to be applied when waste materials arrive on site for processing.

1. Waste Acceptance

1.1 All vehicles delivering waste to site will be weighed prior to being directed to the waste reception area in Zone 1.

1.2 A check shall be made that the waste type and source has been Pre-Accepted in accordance with procedure CPP-E01 Pre-Acceptance.

1.3 Where a waste has not been Pre-Accepted the Site Manager shall be contacted and the waste assessed on specification. The decision of whether the waste can be accepted lies with the Site Manager.

1.4 The following details will be recorded for each individual load accepted on site:-

- Date and time of delivery of the load
- Details and description of the vehicle delivering the waste, the driver's name, and the operator of the vehicle; and
- A description of the waste including type and quantity

1.5 Wastes will only be accepted on site that conform to the following EWC Waste Codes detailed in Table 1 overleaf.

1.6 All wastes should be visually inspected to ensure the following:

- Waste meets the EWC Code definition; and
- Wastes do not exhibit malodorous properties.

1.7 Any wastes that do not meet with the above description and requirements should be refused entry to the site.

1.8 Rejected wastes shall be recorded in the site diary (See procedure CPP-E03).

1.9 The Site Manager holds the responsibility for the acceptance of all wastes onto site.

1.10 It is the responsibility of the weighbridge personnel to inform the Site Manager of any wastes that do not or potentially do not meet the above specification.

Table 1: Accepted Waste Materials
02 WASTES FROM AGRICULTURE, HORTICULTURE, AQUACULTURE, FORESTRY, HUNTING AND FISHING, FOOD PREPARATION AND PROCESSING
02 01 wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing
02 01 03 plant-tissue waste
02 01 04 waste plastics (except packaging)
02 01 07 waste from forestry
02 0110 waste metal
02 02 wastes from the preparation and processing of meat, fish and other foods of animal origin
02 02 02 animal-tissue waste
02 02 03 materials unsuitable for consumption or processing
02 03 wastes from fruit, vegetables, cereals, edible oils, cocoa, coffee, tea and tobacco preparation and processing; conserve production; yeast and yeast extract production, molasses preparation and fermentation
02 03 04 materials unsuitable for consumption or processing
02 05 wastes from the dairy products industry
02 05 01 materials unsuitable for consumption or processing
02 06 wastes from the baking and confectionery industry
02 06 01 materials unsuitable for consumption or processing
02 07 wastes from the production of alcoholic and non-alcoholic beverages (except coffee, tea and cocoa)
02 07 01 wastes from washing, cleaning and mechanical reduction of raw materials
02 07 04 materials unsuitable for consumption or processing
03 WASTES FROM WOOD PROCESSING AND THE PRODUCTION OF PANELS AND FURITURE, PULP, PAPER AND CARDBOARD
03 01 wastes from wood processing and the production of panels and furniture
03 01 01 waste bark and cork
03 01 05 sawdust, shavings, cuttings, wood, particle board and veneer other than those mentioned in 03 01 04
03 03 wastes from pulp, paper and cardboard production and processing
03 03 01 waste bark and wood
03 03 07 mechanically separated rejects from pulping of waste paper and cardboard
03 03 08 wastes from sorting of paper and cardboard destined for recycling
03 03 10 fibre rejects, fibre-, filler-, and coating-sludges from mechanical separation
07 WASTES FROM ORGANIC CHEMICAL PROCESSES
07 02 wastes from the MFSU of plastics, synthetic rubber and man-made fibres
07 02 13 waste plastics
15 WASTE PACKAGING; ABSORBENTS, WIPING CLOTHES, FILTER MATERIALS AND PROTECTIVE CLOTHING NOT OTHERWISE SPECIFIED
15 01 packaging (including separately collected municipal packaging waste
15 01 01 paper and cardboard packaging
15 01 02 plastic packaging
15 01 03 wooden packaging
15 01 04 metallic packaging
15 01 05 composite packaging
15 01 06 mixed packaging
15 01 07 glass packaging
15 01 09 textile packaging
19 WASTES FROM WASTE MANAGEMENT FACILITIES, OFF-SITE WASTE WATER TREATMENT PLANTS AND THE PREPARATION OF WATER INTENDED FROM HUMAN CONSUMPTION AND WASTE FOR INDUSTRIAL USE
19 05 wastes from aerobic treatment of solid wastes

Table 1: Accepted Waste Materials
19 05 01 non-composted fraction of municipal and similar waste
19 05 02 non-composted fraction of animal and vegetable waste
19 05 03 off-specification compost
19 06 wastes from anaerobic treatment of waste
19 06 04 digestate from anaerobic treatment of municipal waste
19 06 06 digestate from anaerobic treatment of animal and vegetable waste
19 08 wastes from waste water treatment plants not otherwise specified
19 08 01 screening
19 08 12 sludges from biological treatment of industrial waste water other than those mentioned in 19 08 11
19 08 14 sludges from other treatment of industrial waste water other than those mentioned in 19 08 03
19 09 wastes from the preparation of water intended for human consumption or water for industrial use
19 09 01 solid waste from primary filtration and screenings
19 09 02 sludges from water clarification
19 12 wastes from the mechanical treatment of waste (for example sorting, crushing, compacting, pelletising) not otherwise specified
19 12 01 paper and cardboard
19 12 02 ferrous metal
19 12 03 non-ferrous metal
19 12 04 plastic and rubber
19 12 05 glass
19 12 07 wood other than mentioned in 19 12 06
19 12 10 combustible waste (refuse derived fuel)
19 12 12 other wastes (including mixtures of materials) from mechanical treatment of wastes other than those mentioned in 19 12 11
20 MUNICIPAL WASTES (HOUSEHOLD WASTE AND SIMULAR COMMERICAL, INDUSTRIAL AND INSTITUTIONAL WASTES). INLCUDING SEPARATELY COLLECTED FRACTIONS.
20 01 separately collected fractions (except 15 01)
20 01 01 paper and cardboard
20 01 02 glass
20 01 08 biodegradable kitchen and canteen waste
20 01 38 wood other than that mentioned in 20 01 37
20 01 39 plastics
20 01 40 metals
20 02 garden and park wastes(including cemetery waste)
20 02 01 biodegradable waste
20 02 03 other non-biodegradable waste
20 03 other municipal wastes
20 03 01 mixed municipal waste
20 03 02 waste from markets
20 03 99 municipal wastes not otherwise specified

2. Waste Reception

2.1 The Weighbridge personnel shall inform the site manager and respective staff of the vehicle arrival.

2.2 Vehicles delivering to the reception area will be directed to follow the designated access route to the Waste Reception Area (Zone 1).

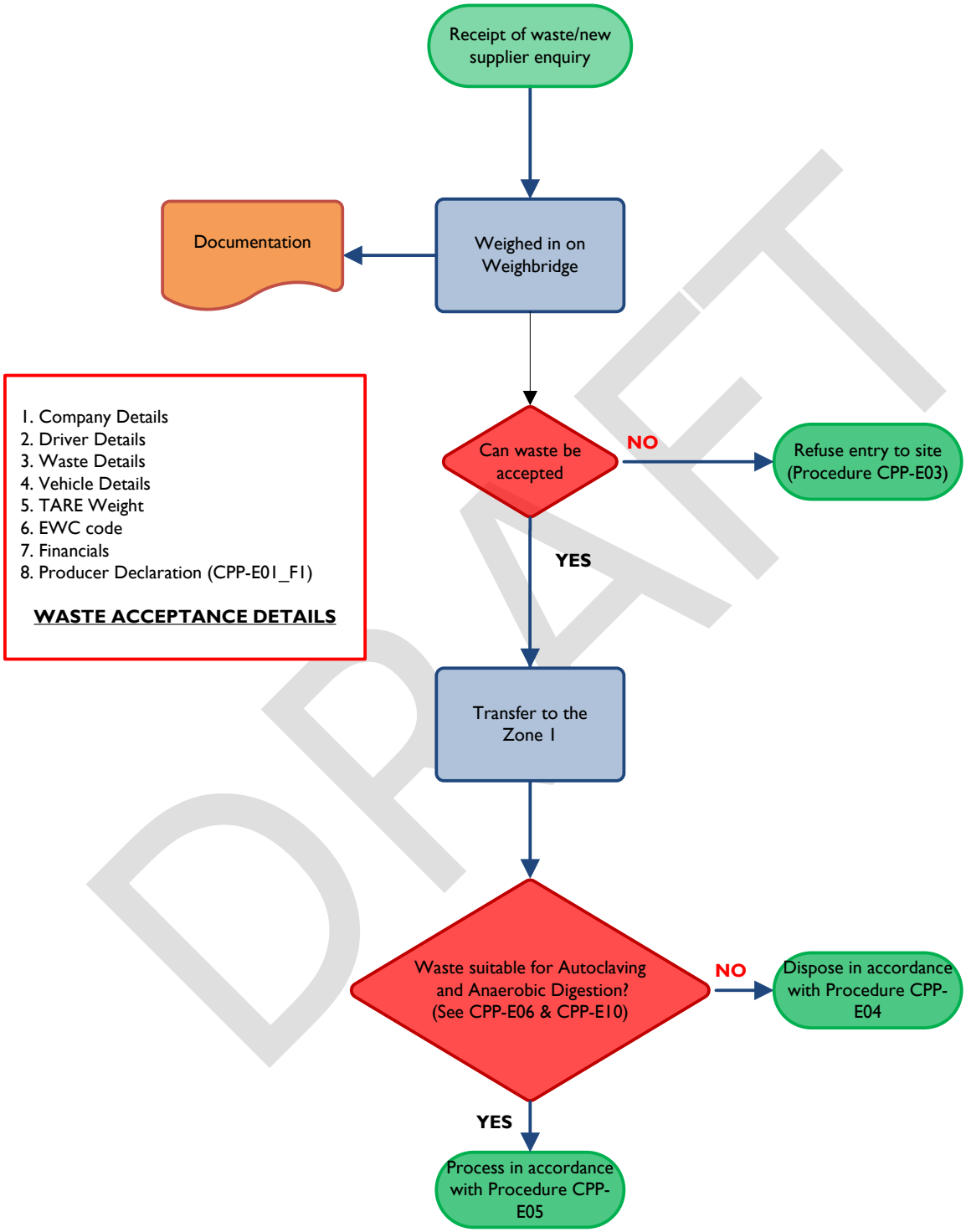
2.3 Vehicles will discharge the waste into a reception hopper within the designated area (in accordance with CPP-E05). The waste will be checked to ensure compliance with the permitted wastes in accordance with the site Environmental Permit and as defined by paragraph 1.5 above.

2.4 Any non-conforming material will be segregated and disposed of in accordance with Procedure CPP-E03 Waste Rejection.

2.5 All waste will be segregated for different treatment processes (dependent on the nature of the waste) in accordance with Procedure CPP-E05 Waste Reception and Preparation.

2.6 Once the delivery is complete vehicles will then be directed to leave the site via the weighbridge, having had their TARE weight recorded.

3. Process flow chart: CPP-E02 Waste Acceptance



4. Training Record

The below signatories have received training and understand all aspects of procedure CPP-E02.

Table 4.1: Training

PRINT EMPLOYEE NAME	EMPLOYEE SIGNATURE	DATE	MANAGER INITIALS	UN-CONTROLLED COPY ISSUED (✓)

Overview

This procedure outlines the waste rejection process for all non-conforming wastes that cannot be processed on site.

Acceptance of non-conforming wastes is a direct breach of the permitted conditions of the site's Environmental Permit.

1. Rejection at the Weighbridge

1.1 Any waste coming across the weighbridge that does not meet the EWC code description below **MUST BE REFUSED ENTRY** to the site. The site can only accept materials that conform to the EWC Waste Codes provided in Table 1 (over leaf):

1.2 If any waste arriving at site is observed to contain any of the following **IT MUST BE REFUSED ENTRY TO THE SITE**.

- Hazardous Waste
- Flammable or explosive materials
- Segregated WEEE wastes
- Segregated Batteries
- Sealed Containers containing chemicals
- Drums and barrels
- Materials identified as Animal By-Products or Abattoir wastes
- Wastes that are malodorous

1.3 Any waste that is rejected or may be subject to rejection should be brought to the attention of the Site Manager.

1.4 The consignor of the waste must be contacted by the Site Manager and be made aware that the waste has been rejected.

1.5 The Site Manager holds the responsibility for the acceptance / rejection of all wastes onto site.

1.6 It is the responsibility of the weighbridge personnel to inform the site manager of any wastes that do not or potentially do not meet the above specification.

1.7 If a non-conforming waste has not entered the site, i.e. identified at the weighbridge, the haulier is refused entry into the site and a waste rejection form (CPP-E03_F1) is completed.

1.8 All Waste Rejections shall be recorded in the Site Register.

2. Rejection at the Reception Area

2.1 Any wastes delivered to the waste reception area (Zone 1) must be visually inspected for the following:

- Material is able to be processed;
- Wastes does not contain extraneous materials; and
- Wastes are not malodorous.

2.2 Any materials that do not meet the above requirements shall be rejected from site.

2.3 Any waste that is rejected or may be subject to rejection should be brought to the attention of the Site Manager.

2.4 The consignor of the waste must be contacted by the Site Manager and be made aware that the waste has been rejected.

2.5 The Site Manager holds the responsibility for the acceptance / rejection of all wastes onto site.

2.6 The installation supervisor will check each load visually as it is deposited to ensure that it does not contain any unacceptable waste(s). The supervisor may quarantine the waste load whilst investigations take place.

2.7 It is the responsibility of the supervisor / site personnel to inform the site manager of any wastes that do not or potentially do not meet the above specification.

2.8 If a non-conforming waste is to be temporarily quarantined on site, it is placed in the maintained, contained and labelled waste quarantine area.

2.9 If the non-conforming waste has entered the site, and is subsequently rejected, a waste rejection form (CPP-E03_F1) is completed. However, if the non-conforming waste has not entered the site, i.e. identified at the weighbridge, the haulier is refused entry into the site.

2.10 All Waste Rejections shall be recorded in the Site Register.

Table 1: Accepted Waste Materials
02 WASTES FROM AGRICULTURE, HORTICULTURE, AQUACULTURE, FORESTRY, HUNTING AND FISHING, FOOD PREPARATION AND PROCESSING
02 01 wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing
02 01 03 plant-tissue waste
02 01 04 waste plastics (except packaging)
02 01 07 waste from forestry
02 0110 waste metal
02 02 wastes from the preparation and processing of meat, fish and other foods of animal origin
02 02 02 animal-tissue waste
02 02 03 materials unsuitable for consumption or processing
02 03 wastes from fruit, vegetables, cereals, edible oils, cocoa, coffee, tea and tobacco preparation and processing; conserve production; yeast and yeast extract production, molasses preparation and fermentation
02 03 04 materials unsuitable for consumption or processing
02 05 wastes from the dairy products industry
02 05 01 materials unsuitable for consumption or processing
02 06 wastes from the baking and confectionery industry
02 06 01 materials unsuitable for consumption or processing
02 07 wastes from the production of alcoholic and non-alcoholic beverages (except coffee, tea and cocoa)
02 07 01 wastes from washing, cleaning and mechanical reduction of raw materials
02 07 04 materials unsuitable for consumption or processing
03 WASTES FROM WOOD PROCESSING AND THE PRODUCTION OF PANELS AND FURITURE, PULP, PAPER AND CARDBOARD
03 01 wastes from wood processing and the production of panels and furniture
03 01 01 waste bark and cork
03 01 05 sawdust, shavings, cuttings, wood, particle board and veneer other than those mentioned in 03 01 04
03 03 wastes from pulp, paper and cardboard production and processing
03 03 01 waste bark and wood
03 03 07 mechanically separated rejects from pulping of waste paper and cardboard
03 03 08 wastes from sorting of paper and cardboard destined for recycling
03 03 10 fibre rejects, fibre-, filler-, and coating-sludges from mechanical separation
07 WASTES FROM ORGANIC CHEMICAL PROCESSES
07 02 wastes from the MFSU of plastics, synthetic rubber and man-made fibres
07 02 13 waste plastics
15 WASTE PACKAGING; ABSORBENTS, WIPING CLOTHES, FILTER MATERIALS AND PROTECTIVE CLOTHING NOT OTHERWISE SPECIFIED
15 01 packaging (including separately collected municipal packaging waste
15 01 01 paper and cardboard packaging
15 01 02 plastic packaging
15 01 03 wooden packaging
15 01 04 metallic packaging
15 01 05 composite packaging
15 01 06 mixed packaging
15 01 07 glass packaging
15 01 09 textile packaging
19 WASTES FROM WASTE MANAGEMENT FACILITIES, OFF-SITE WASTE WATER TREATMENT PLANTS AND THE PREPARATION OF WATER INTENDED FROM HUMAN CONSUMPTION AND WASTE FOR INDUSTRIAL USE
19 05 wastes from aerobic treatment of solid wastes

Table 1: Accepted Waste Materials
19 05 01 non-composted fraction of municipal and similar waste
19 05 02 non-composted fraction of animal and vegetable waste
19 05 03 off-specification compost
19 06 wastes from anaerobic treatment of waste
19 06 04 digestate from anaerobic treatment of municipal waste
19 06 06 digestate from anaerobic treatment of animal and vegetable waste
19 08 wastes from waste water treatment plants not otherwise specified
19 08 01 screening
19 08 12 sludges from biological treatment of industrial waste water other than those mentioned in 19 08 11
19 08 14 sludges from other treatment of industrial waste water other than those mentioned in 19 08 03
19 09 wastes from the preparation of water intended for human consumption or water for industrial use
19 09 01 solid waste from primary filtration and screenings
19 09 02 sludges from water clarification
19 12 wastes from the mechanical treatment of waste (for example sorting, crushing, compacting, pelletising) not otherwise specified
19 12 01 paper and cardboard
19 12 02 ferrous metal
19 12 03 non-ferrous metal
19 12 04 plastic and rubber
19 12 05 glass
19 12 07 wood other than mentioned in 19 12 06
19 12 10 combustible waste (refuse derived fuel)
19 12 12 other wastes (including mixtures of materials) from mechanical treatment of wastes other than those mentioned in 19 12 11
20 MUNICIPAL WASTES (HOUSEHOLD WASTE AND SIMULAR COMMERICAL, INDUSTRIAL AND INSTITUTIONAL WASTES). INLCUDING SEPARATELY COLLECTED FRACTIONS.
20 01 separately collected fractions (except 15 01)
20 01 01 paper and cardboard
20 01 02 glass
20 01 08 biodegradable kitchen and canteen waste
20 01 38 wood other than that mentioned in 20 01 37
20 01 39 plastics
20 01 40 metals
20 02 garden and park wastes(including cemetery waste)
20 02 01 biodegradable waste
20 02 03 other non-biodegradable waste
20 03 other municipal wastes
20 03 01 mixed municipal waste
20 03 02 waste from markets
20 03 99 municipal wastes not otherwise specified

3. Flow Chart: CPP-E03 Waste Rejection

Municipal Waste

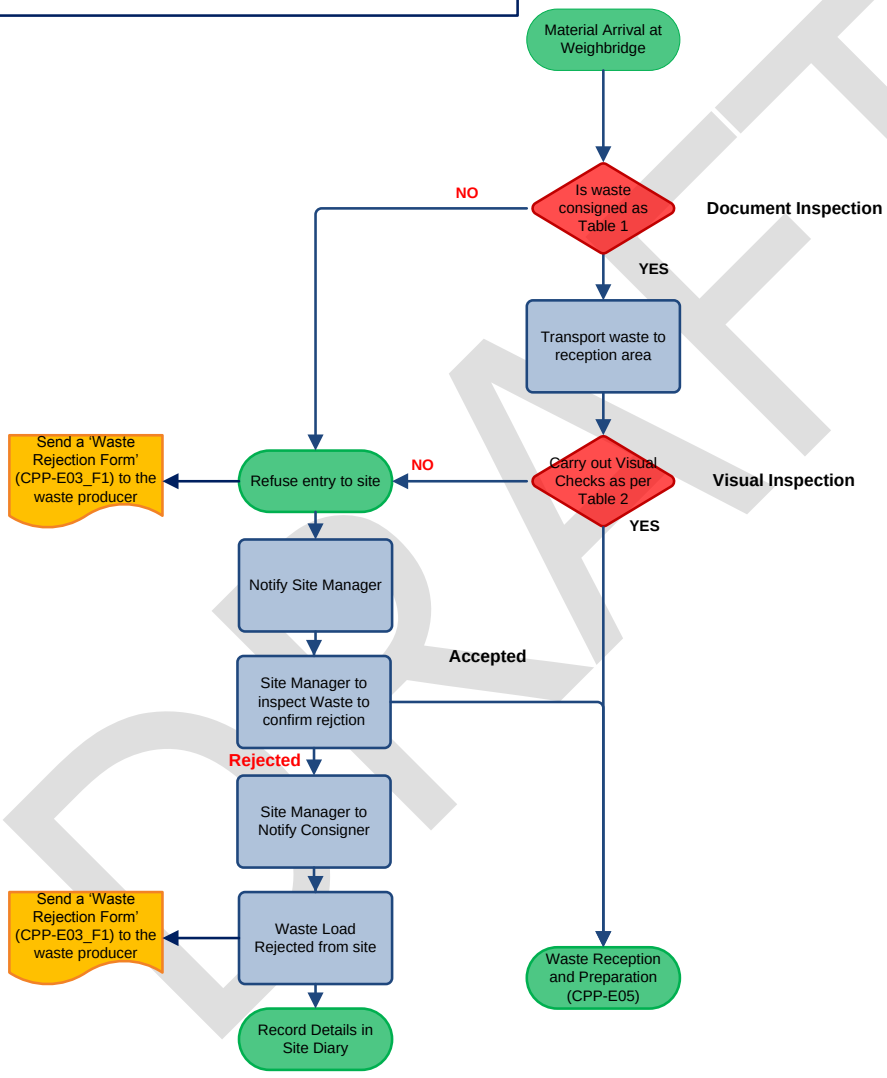
20-03-01	*Mixed municipal waste*
20-03-02	*Waste from markets*
20-03-99	*Municipal wastes not otherwise*

Green Waste
02-01-03, 03-01-01, 19-05-01, 19-05-02, 19-05-03, 20-02-01, 20-03-02

TABLE 1: EWC codes of wastes accepted into site

No hazardous waste
No flammable or explosive materials
No segregated WEE wastes
No segregated batteries
No sealed containers containing chemicals
No drummed waste
No animal by-product or abattoir wastes
No malodorous waste
No waste consisting of mainly dusts, powders or loose fibres

TABLE 2: Visual Checks



4. Training Record

The below signatories have received training and understand all aspects of procedure CPP-E03.

Table 4.1: Training

PRINT EMPLOYEE NAME	EMPLOYEE SIGNATURE	DATE	MANAGER INITIALS	UN-CONTROLLED COPY ISSUED (✓)

Overview

This procedure provides the necessary information to enable the assessment and off site transfer of non-conforming or untreatable waste streams.

1. Off site Waste Transfers

1.1 Typical materials that are likely to be transferred from the Wheldon site on a regular basis include (but are not limited to) the following:

Table 1: Table of Transferred Wastes

Waste Type	EWC Code	EWC Description	Site Management	Disposal Route
Ferrous metals	02 01 10, 12 01 01, 12 01 02, 15 01 04, 16 01 17, 17 04 05, 17 04 09*, 19 01 02, 19 10 01, 19 12 02, 20 01 40	Ferrous metal scrap	Stored in dedicated recyclate storage bay (on concrete hardstanding)	Transferred off-site for further processing and re-use
Non-Ferrous Metals	02 01 10, 15 01 04, 17 04 07, 20 01 40	Ferrous and non-ferrous metal (mixed) scrap	Stored in dedicated recyclate storage bay (on concrete hardstanding)	Transferred off-site for further processing and re-use
Plastics	02 01 04, 07 02 13, 12 01 05, 15 01 02, 16 01 19, 17 02 03, 17 02 04*, 19 12 04, 20 01 39	Mixed Plastics	Stored in dedicated recyclate storage bay (on concrete hardstanding)	Transferred off-site for further processing and re-use
Glass	20 01 02	Bottles - glass, Civic amenity waste, Containers - glass, Containers - glass (contaminated), Fibreglass, Glass, Glass bottles, Glass containers, Glass fibre, Glass pots, Vitreous enamels	Stored in dedicated recyclate storage bay (on concrete hardstanding)	Transferred off-site for further processing and re-use

Waste ash (char)	19 01 12	Combustion residue (MSW) - bottom ash	Stored in a segregated waste skip (on concrete hardstanding)	Transferred off-site for further processing and re-use
Mixed General Waste (office and general wastes) – Non Hazardous	19-12-12	Other wastes (including mixtures of materials)	Stored in segregated waste skip (on concrete hardstanding)	Transferred off site for disposal
Waste oils and greases (workshop and vehicle wastes)	13-02-05	Non Chlorinated Engine / Lubricating Oils	Stored in barrels / drums and stored internally within the maintenance area prior to off site transfer	Transferred off site for disposal
Off spec / non-compliant feedstock materials	Various	Various	Segregated / suitably contained within the main building and transferred off site through third parties.	Transferred to licensed treatment facility
Digestate (not deemed PAS 110 compliant)	19-06-06	Digestate from anaerobic treatment of animal and vegetable waste	Stored in digestate storage tank (enclosed with double membrane roof) on concrete hardstanding area	Transferred to exempted or licensed third parties for land/soil conditioning or fertilisation

All of the above materials are classified as wastes in accordance with The List of Wastes (LOW) Regulations 2005, which transpose the European Waste Catalogue (EWC) into domestic legislation, and provide codes for all hazardous and non-hazardous wastes.

Note that despite having a commercial value, biomass fuel feedstocks are classified as waste until they are recovered or reprocessed at their destination.

1.2 All wastes being transferred on site must be consigned to an appropriately qualified carrier. This is a legal requirement under the Environmental Protection Act S34 and of the Environmental Protection (Duty of Care Regulations) 1991.

1.3 Prior to the offsite transfer of any wastes to a third party a check should be made to ensure that the carrier is appropriately licensed. The link to the national database is provided below: (http://www2.environment-agency.gov.uk/epr/search.asp?id=EP8&&type=register)

1.4 Each consignment should be accompanied with an appropriately completed Waste Transfer Note. A template Waste Transfer Note is included in Annex A.

1.5 The following details will be recorded for each individual load transferred from on site:-

- Date and time of transfer of the load;
- Details and description of the vehicle accepting the waste, the driver's name, and the operator of the vehicle; and
- A description of the waste including type, EWC code and quantity

1.6 The Site Manager holds the responsibility for the correct description of all consigned wastes from site.

1.7 It is the responsibility of the weighbridge personnel to correctly log and record any waste transfers from site, ensure that the Carrier is appropriately licensed and that all relevant information is recorded.

1.8 All waste transfers should be recorded in the site diary by the Site Manager.

2. Training Record

The below signatories have received training and understand all aspects of procedure CPP-E04.

Table 2.1: Training

PRINT EMPLOYEE NAME	EMPLOYEE SIGNATURE	DATE	MANAGER INITIALS	UN-CONTROLLED COPY ISSUED (✓)

Overview

The inspection of wastes and selecting the appropriate process for their treatment/disposal when they arrive at site is a key process in ensuring maximum Biomass Fibre and recyclate yield from the autoclaving process and ensuring maximum biogas yield from the anaerobic digestion process, whilst minimising the potential contamination issues.

This procedure outlines the initial screening and decision making process that needs to be applied in order to determine the most suitable treatment method for incoming wastes.

1. Screening

1.1 There are various types of feedstock accepted on site for processing, approximate types and frequency of deliveries as follows:

- Mixed Source Waste (MSW) – delivered by dedicated and local authority permitted carriers 5 - 6 days per week – approx 350 tonnes / day (approximately five deliveries).
- Non-hazardous food waste – delivered by dedicated and licensed haulier vehicles 5 - 6 days per week – approx 150 tonnes / day (approximately three delivery).

1.2 Once waste is accepted on-site (in accordance with CPP-E02), it shall be delivered to the reception hoppers in the main building, where the Site Manager shall determine the nature of the waste.

1.3 Table 1.1 details typical wastes accepted on-site and their characteristics;

Table 1.1; Typical wastes accepted on-site

Nature	Description	Typical reception route	Suitable for autoclaving	Suitable for anaerobic digestion	See Procedure
Mixed Source Waste	'Black bag' waste from predominantly residential areas	- Unloaded into reception hopper (via front end loader) - Directly fed into the E-Clave units (via a retractable conveyor)	✓		CPP-E06
Food Waste		- Unloaded into a dedicated reception bay - Pure biomass matter will be macerated, blended and pumped directly into the digestion tanks		✓	CPP-E10

2 Traceability

2.1 Each waste load shall be allocated an individual reference number and recorded in the Site Register. Reference numbers shall adopt the following nomenclature;

LA - 200611 - A

(Supplier; LA) *(Date received; ddmmyy)* *(sequential lettering; batches per day)*

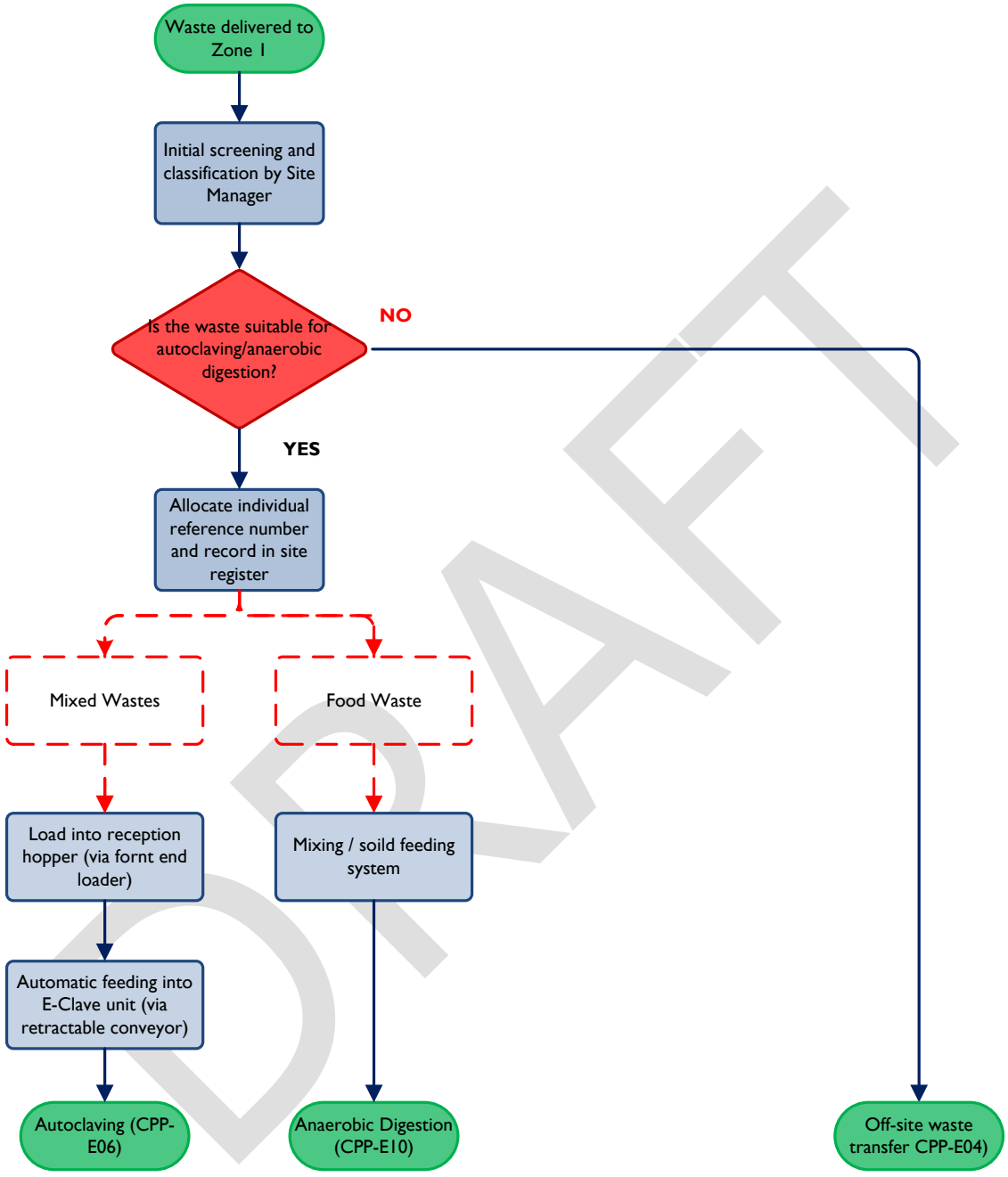
2.2 All material received at the Facility will be accompanied by details of the date, time, quantity, waste type and the supplier. Records of each delivery will be maintained on-site for a minimum of two years after inspection.

2.3 Material arriving at the Facility will be processed in accordance with the Autoclaving Procedure CPP-E06 and the Anaerobic Procedure CPP-E10. In accordance with this procedure the date, time, quantity and supplier of waste material processed will be recorded.

2.4 Waste that is determined as suitable for autoclaving and the anaerobic digestion process must be screened by the Site Manager in order to determine whether any pre-treatment is required.

2.5 ANY WASTE THAT IS CONSIDERED TO POSE A RISK TO THE AUTOCLAVING/ANAEROBIC DIGESTION PROCESS CAN NOT BE SUBMITTED FOR AUTOCLAVING/ANAEROBIC DIGESTION

3. Process flow chart: EMS-E05 Waste Reception



4. Training Record

The below signatories have received training and understand all aspects of procedure CPP-E05.

Table 4.1: Training

PRINT EMPLOYEE NAME	EMPLOYEE SIGNATURE	DATE	MANAGER INITIALS	UN-CONTROLLED COPY ISSUED (✓)

Overview

This procedure outlines steps taken during autoclaving whereby non-hazardous municipal waste is processed through high-pressure steam treatment in order to produce Biomass Fibre and recyclates. The current autoclaving plant comprises two separate E-Clave units and is designed to process a throughput capacity of approximately 128,000 Tonnes per annum.

1. Loading

1.1 The waste is unloaded into the waste reception area and visually inspected as part of the pre-processing preparation.

1.2 The waste is then loaded via a grab crane into a waste hopper. This hopper will then automatically discharge onto a retractable conveyor which loads the waste into one of the two-steam E-Claves.

1.3 Any waste arriving on-site must be brought to the attention of the Site Manager, who will assess the suitability of the waste for autoclaving and assign the waste to a dedicated reception route (in accordance with CPP-E05) based on source / composition.

1.4 The Site Manager holds the responsibility for the maintenance of plant and condition of the incoming waste.

1.5 The Site Manager shall ensure that a suitably competent site operative is present during the loading of each batch, such that all automated processes are suitable monitored.

2. Autoclaving

2.1 Each E-Clave vessel is mounted upon a heavy-duty steelwork structure incorporating load cells to provide accurate weight measurement. Each vessel is also mechanically driven to position the vessels for loading, unloading and rotation during the autoclaving/pressure-cooking period.

2.2 An automatic control system dictates the sequenced operation and control of the steam pressurisation, steam venting and vessel depressurisation procedures via a steam distribution system complete with all the necessary hardware.

2.3 Steam for the treatment is initially supplied from a conventional packaged boiler system and subsequently from heat recovery steam boilers connected to the pyrolysis units. This is then delivered to the steam storage system charged to 16 Bar. Dry saturated steam at 5-7 Bar is supplied to the relevant E-Clave via a steam distribution system under the supervision of the central control system.

2.4 The steam and waste is mixed when the E-Clave rotates, allowing a conversion and sterilisation process to convert the biomass into cellulose fibres. The waste is treated by the steam and is kept at a constant temperature of over 160°C for a predetermined period. Following autoclaving of the waste material, the original volume has been reduced by 80%. The other components within the waste are clean and sanitised, plastics shrink and form a generally spherical shape due to the temperature within the E-Clave.

2.5 Any subsequent changes in temperature (i.e. from plant failure) should be bought to the attention of the Site Manager.

3. Depressurisation

3.1 Following completion of the process cycle the E-Clave™ is automatically depressurised. The exhaust steam is condensed and following recovery of the waste heat the condensate is taken to a cleaning system for reuse as boiler feed water.

3.2 The small amounts of make up water required pass through a Base Exchange Softening Plant where during the backwash cycle, backwash water containing magnesium and calcium salts are discharged to sewer.

3.3 In addition to these water emissions, condensate forms when the exhaust steam is condensed during the depressurisation cycle. It is then directly routed to the condensate treatment system. Within the treatment system, pH is balanced to neutral prior to being passed through a system which removes suspended solids and most dissolved solids. The removed solids are then discharged to a settling tank. Any captured solids are then finally discharged to the E-Clave.

3.4 Following this treatment the condensate passes through a series of filters. The filters are used as polishing devices to remove any traces of solids and remove any remaining odour.

3.5 Finally the filtered condensate is passed through a Reverse Osmosis Unit (RO), which is designed to remove any remaining organic solids. The small amount of non-condensable gases within the E-Clave exhaust are contained and routed to the vortex unit of the Pyrolysis system after which it is discharged to atmosphere in an odourless condition.

3.6 Following depressurisation the E-Clave door is automatically opened to allow unloading of the processed material. When the door is opened low temperature vapour is released. This vapour is captured within a canopy and ducted to the Vortex Unit of the Pyrolysis system. The captured vapour and ambient air is completely odourless before discharge to atmosphere

3.7 Any subsequent changes in temperature (i.e. from plant failure) should be bought to the attention of the Site Manager.

4. Recyclate Segregation

4.1 The processed material is unloaded from the E-Clave vessel onto a moving floor which transfers the material to a feed conveyor which feeds a trommel unit for separation of the oversize fraction.

4.2 The material is then routed to an over band magnet and eddy current separator for the removal of ferrous and non-ferrous metals, the metals are compacted and baled to enable maximum load density for shipping.

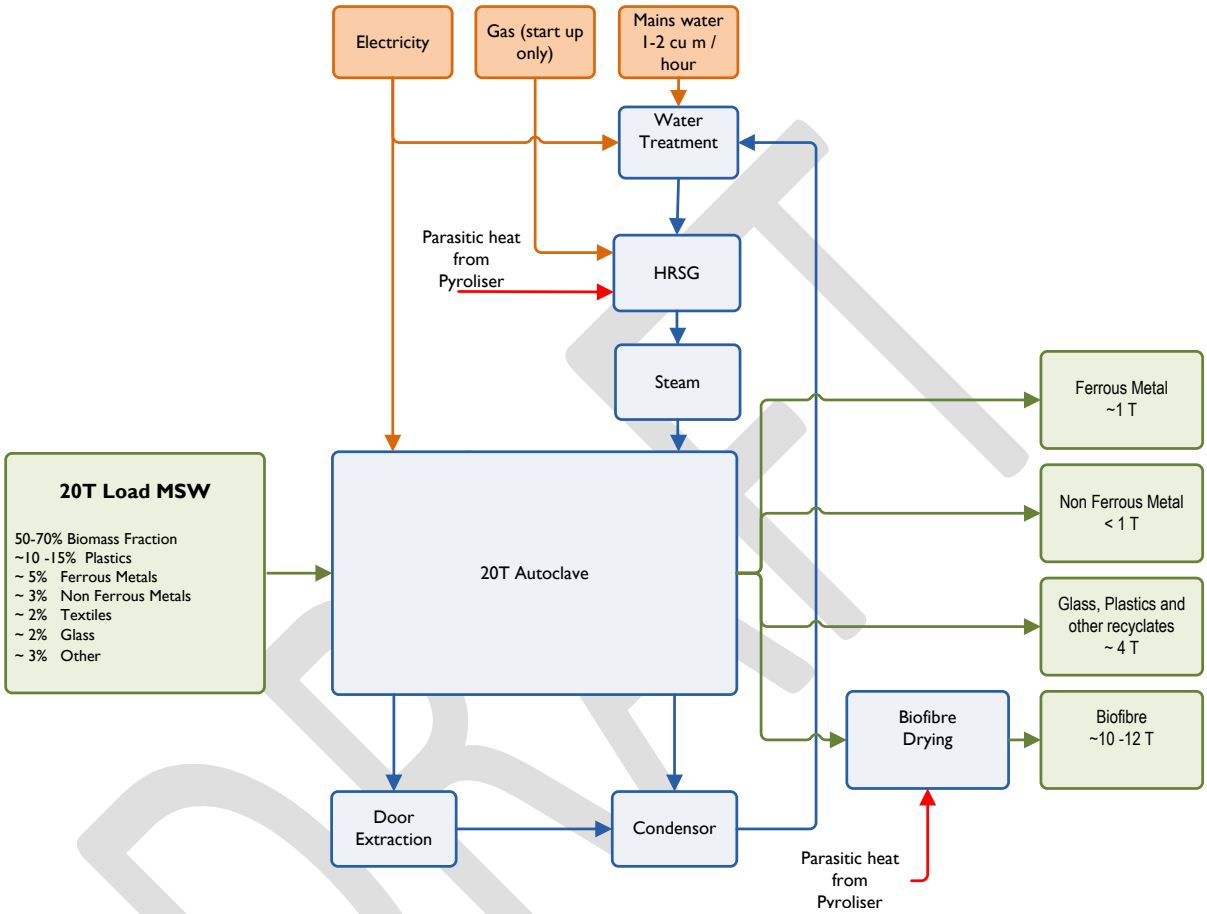
4.3 Plastic materials are removed by hand or are automatically removed by optical grading systems, the different plastic types are then baled to enable maximum load density for shipping.

5. BioFibre Treatment

5.1 Following the removal of all recyclates, the processed fibre (BioFibe™) is passed under a second over band magnet to remove further small metal items before being treated in an air density separator to further purify the fibre.

5.2 After exiting the air density separator the fibre is dried using thermal energy that would otherwise be waste heat and stored for use in the pyrolysis units.

6. Flow Chart: CPP-E06 Autoclaving



7. Training Record

The below signatories have received training and understand all aspects of procedure CPP-E06.

Table 7.1: Training

PRINT EMPLOYEE NAME	EMPLOYEE SIGNATURE	DATE	MANAGER INITIALS	UN-CONTROLLED COPY ISSUED (✓)

Overview

This procedure outlines steps taken during anaerobic digestion whereby non-hazardous food waste is processed through biological treatment to form biogas and solid digestate. The Anaerobic Digestion plant is anticipated to process a throughput capacity of 67,000 tonnes per annum of food waste.

1. Loading

1.1 Waste that is deemed suitable for Anaerobic Digestion is transported to the substrate reception area.

1.2 Any waste arriving on-site must be brought to attention of the Site Manager, who will access the suitability of the waste for digestion and assign the waste to a dedicated reception route (in accordance with CPP-E05) based on source / composition.

1.3 All waste is pumped into the primary digestion tanks.

1.4 The tanks are above ground to allow easy pumping of substrate. The substrate is mixed and preheated within the tank to avoid separation of material and provide a minimum temperature.

1.5 The Site Manager holds responsibility for the maintenance of plant and condition of the pre-digestion substrate.

2. Primary Digestion

3.1 The waste slurry is loaded into two digester tanks (25m x 6m), whereby it is maintained at a mesophillic temperature (45-50 °C) for up to 64 days to allow sufficient anaerobic digestion of the substrate and optimum biogas yields.

3.2 The digester tanks have a leak detection system installed, are fully insulated and covered with cladding and are equipped with all necessary instrumentation and safety equipment. The tanks are also equipped with mixing systems and a double membrane roof as gas storage. Biogas is collected in the tank membrane and pumped to the gas treatment unit for the removal of residual condensate.

3.3 Constant mixing within an enclosed system will also ensure that anaerobic conditions are maintained which will minimise odour production.

3.4 Biogas is collected in the tank membrane and pumped to the gas treatment unit, containing a dryer for the removal of residual condensate. The biogas is then fed into a CHP unit and combusted.

3.5 The Site Manager is responsible for recording the temperature and elapsed digestion period of each batch entering the digestion tanks in the Site Register (See Procedure CPP-E14).

3.6 All batches shall be labelled in accordance with Procedure CPP-E05.

3.7 Any subsequent changes in temperature (i.e. from plant failure) should be bought to the attention of the Site Manager.

3.8 When a sufficient digestion period has elapsed (determined by decreasing gas yield rates), the remaining digestate is pumped to the secondary digestion tanks.

3. Hygienisation and Cooling

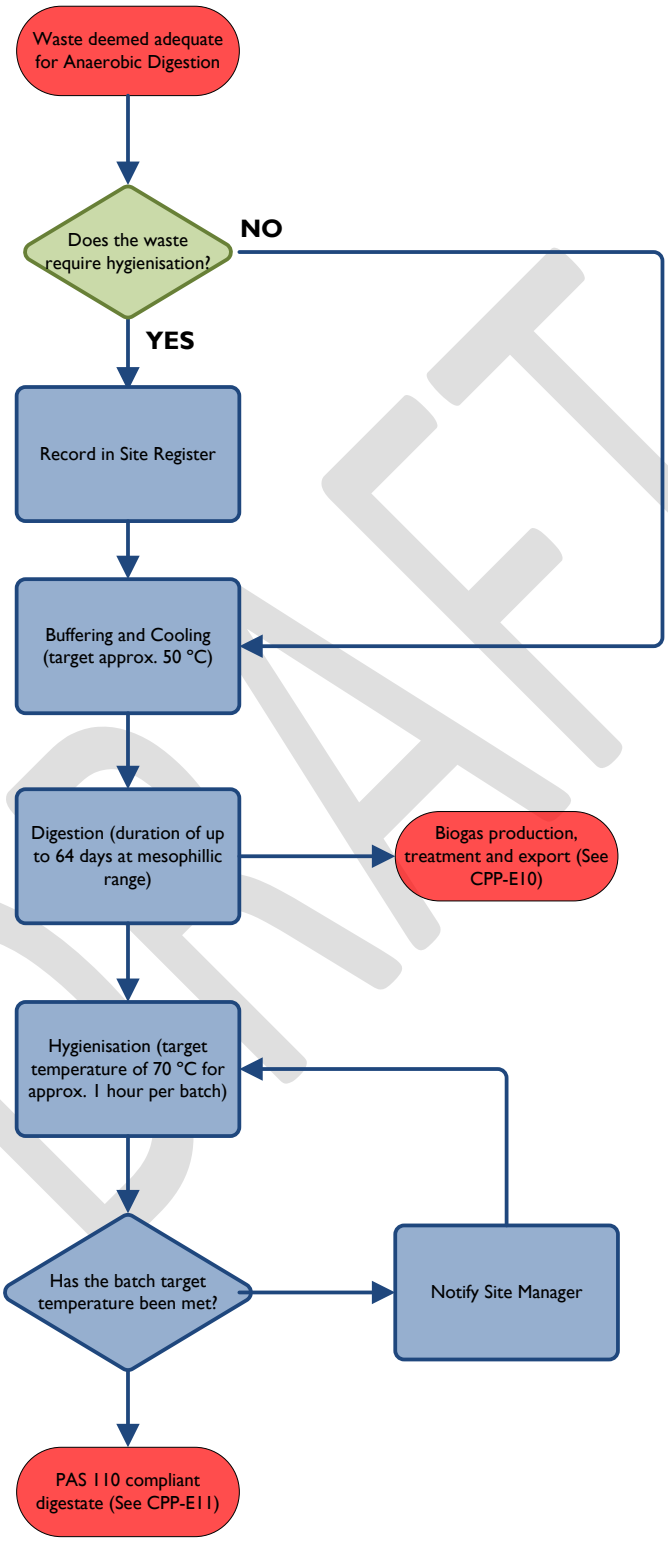
2.1 All digestate from the secondary digestion tanks is automatically pumped to the hygienisation units located within the reception building, where the waste is mechanically heat treated (pasteurised) at a target temperature of 70°C for 1 hour. This process removes any potentially harmful pathogens from the waste. The reception building is operated under negative pressure and equipped with biofilters for the treatment of air emissions arising from the hygienisation process.

2.2 The Site Manager is responsible for recording the temperature and elapsed hygienisation period of each batch entering the unit in the Site Register.

2.3 Any subsequent changes in temperature (i.e. from plant failure) should be bought to the attention of the Site Manager.

2.4 Treated substrate is automatically pumped to the filter press, where solid materials are recovered and returned to the autoclave reception area. All liquid is pumped to the batch storage tanks awaiting collection and transfer.

4. Flow Chart: CPP-E10 Anaerobic Digestion



5. Training Record

The below signatories have received training and understand all aspects of procedure CPP-E06.

Table 5.1: Training

PRINT EMPLOYEE NAME	EMPLOYEE SIGNATURE	DATE	MANAGER INITIALS	UN-CONTROLLED COPY ISSUED (✓)