sol
environment

EPR SWIP PERMIT APPLICATION SUPPORT DOCUMENT

Renewable Asset Ltd

Waste Woodchip CHP Facility

Prepared by:
Sol Environment Ltd

Date:
November 2015

Project Issue Number:
SOL1510RA01

Contents

Index of Tables

Index of Figures

HVAC	HVAC (heating, ventilation, and air conditioning) is the technology of indoor and vehicular environmental comfort.
ISO14001	ISO 14000 is a family of standards related to environmental management that exists to help organizations (a) minimize how their operations (processes etc.) negatively affect the environment (i.e. cause adverse changes to air, water, or land); (b) comply with applicable laws, regulations, and other environmentally oriented requirements, and (c) continually improve in the above.
LAQM	Local Air Quality Management.
NO	Nitrogen monoxide, a.k.a. nitric oxide.
NO_2	Nitrogen dioxide.
NOx	Nitrogen oxides.
O_3	Ozone.
PAH	Polycyclic aromatic hydrocarbons (PAHs), also known as poly-aromatic hydrocarbons or polynuclear aromatic hydrocarbons, are potent atmospheric pollutants that consist of fused aromatic rings and do not contain heteroatoms or carry substituents. Naphthalene is the simplest example of a PAH. PAHs occur in oil, coal, and tar deposits, and are produced as by-products of fuel burning (whether fossil fuel or biomass). As a pollutant, they are of concern because some compounds have been identified as carcinogenic, mutagenic, and teratogenic.
Percentile	The percentage of results below a given value.
PLC	A Programmable Logic Controller, PLC or Programmable Controller is a digital computer used for automation of electromechanical processes, such as control of machinery.
PM_{10}	Particulate matter with an aerodynamic diameter of less than 10 micrometres.
PPB parts per billion	The concentration of a pollutant in the air in terms of volume ratio. A concentration of 1 ppb means that for every billion (10^9) units of air, there is one unit of pollutant present.
PPM parts per million	The concentration of a pollutant in the air in terms of volume ratio. A concentration of 1 ppm means that for every billion (10^6) units of air, there is one unit of pollutant present.
Ratification (Monitoring)	Involves a critical review of all information relating to a data set, in order to amend or reject the data. When the data have been ratified they represent the final data to be used (see also validation).
RDF	Refuse-derived fuel (RDF) or solid recovered fuel/ specified recovered fuel (SRF) is a fuel produced by shredding and dehydrating solid waste (MSW) with a Waste converter technology. RDF consists largely of combustible components of municipal waste such as plastics and biodegradable waste.
Renewable Energy	Renewable energy is generally defined as energy that comes from resources which are continually replenished on a human timescale such as sunlight, wind, rain, tides, waves and geothermal heat.

NON TECHNICAL SUMMARY

Renewable Asset Ltd is making this application for a Small Waste Incineration Plant (SWIP) Permit Application under The Environmental Permitting (England and Wales) Regulations 2014 for the proposed operation of a Waste Wood Combustion (SWIP) and Combined Heat and Power Facility at a site in Hill Barton Industrial Park, Clyst St Mary.

The proposed Installation is located at Hill Barton, Sidmouth Road, Clyst St. Mary, Exeter, EX5 1DR (Grid Reference: SY 00392 91092) and adjoins the neighbouring waste processing facility 'EMS Waste Services Ltd'.

The proposed development is a '*WID Compliant*' [1]combined heat and power (CHP) that operates using Grades B&C waste wood chip to produce clean renewable heat and power.

The development will consist of a single SWIP activity which will provide heat to an associated (drying) activity which is technically linked to the neighbouring waste management process:

- The SWIP will combust approximately 14,000 tonnes per annum of Grade B and C waste wood per annum, which will be used directly for the generation of renewable heat and electrical production; and
- Recovered heat is used within a directly associated 'Belt Dryer' for the purposes of drying approximately 10,000 – 20,000 TPA of RDF materials on the behalf of the neighbouring waste management facility (EMS Waste Services Ltd).

Due to the proposed development being below the Part A(1) trigger threshold capacity[2] threshold stated within the EPR Regulations (Section 5.1), the development is considered to be a '*Small Waste Incineration Plant*' (SWIP).

Accordingly, the SWIP Activity will be permitted by the Local Authority and will be operated in accordance with the Environmental Permitting (England and Wales) Regulations 2014 and Chapter IV of the Industrial Emissions Directive.

All waste activities associated with the production and processing of RDF by EMS Waste Services Ltd) are regulated separately by the Environment Agency under separate permit and do not fall within the Installation Boundary of this application.

General Overview

The proposed development will utilise a '*WID Compliant*' Combustion Plant to produce heat, which will in turn be recovered through the use of ORC (Organic Rankine Cycle) generation plants, to produce renewable electricity.

1 'WID Compliant' is a reference to the former Waste Incineration Directive, now superseded by the Chapter IV of the Industrial Emissions Directive

2 Chapter 5.1 A(1) 'Incineration and Co-incineration' of Schedule 1 of the Environmental Permitting Regulations provides a threshold of 3 tonnes per hour for non-hazardous wastes.

Odour

Due to the design of the building structure, the fully enclosed processing activities and the nature of the waste materials stored and processed on site, there is very little potential for offsite odour emissions and impacts to arise from the site. Any odour arising from any aspect of the plant will be thermally oxidised through the combustion plant.

Emissions to Controlled Water and Sewer

There will be no direct process emissions to controlled water sewer arising from the proposed development.

Emissions to Land

There will be no emissions to land arising from the proposed development.

Impact

The air emissions from the proposed development have been modelled using AERMOD atmospheric dispersion modelling software.

The air quality impact assessment considered the air impacts to all identified residential, sensitive habitat and ecological receptors.

It is the conclusion of the modelling that the facility is unlikely to have a significant impact at any of the receptor locations examined and is unlikely to have a significant impact on the environment.

All of the air emissions from the development have been risk assessed against their potential impact on human health. The results of the assessment are that the proposed facility will not present any risk to human health.

- Section 6: Provides an Environmental Impact and Assessment of the Installation against the requirements of the Habitats Directive.

All technical appendices associated with the SWIP comprise the following:

- Annex A: Figures;
- Annex B: Energy Balance
- Annex C: Air Quality Assessment;
- Annex D: Noise Assessment;
- Annex E: Draft Working Plan;
- Annex F: Accident Management Plan;
- Annex G: Planning Permission; and
- Annex H: WAMITAB Certification.

The location of the Installation is provided overleaf in Figure 1.1.

The site layout and Installation Boundary is provided in Figure 1.2.

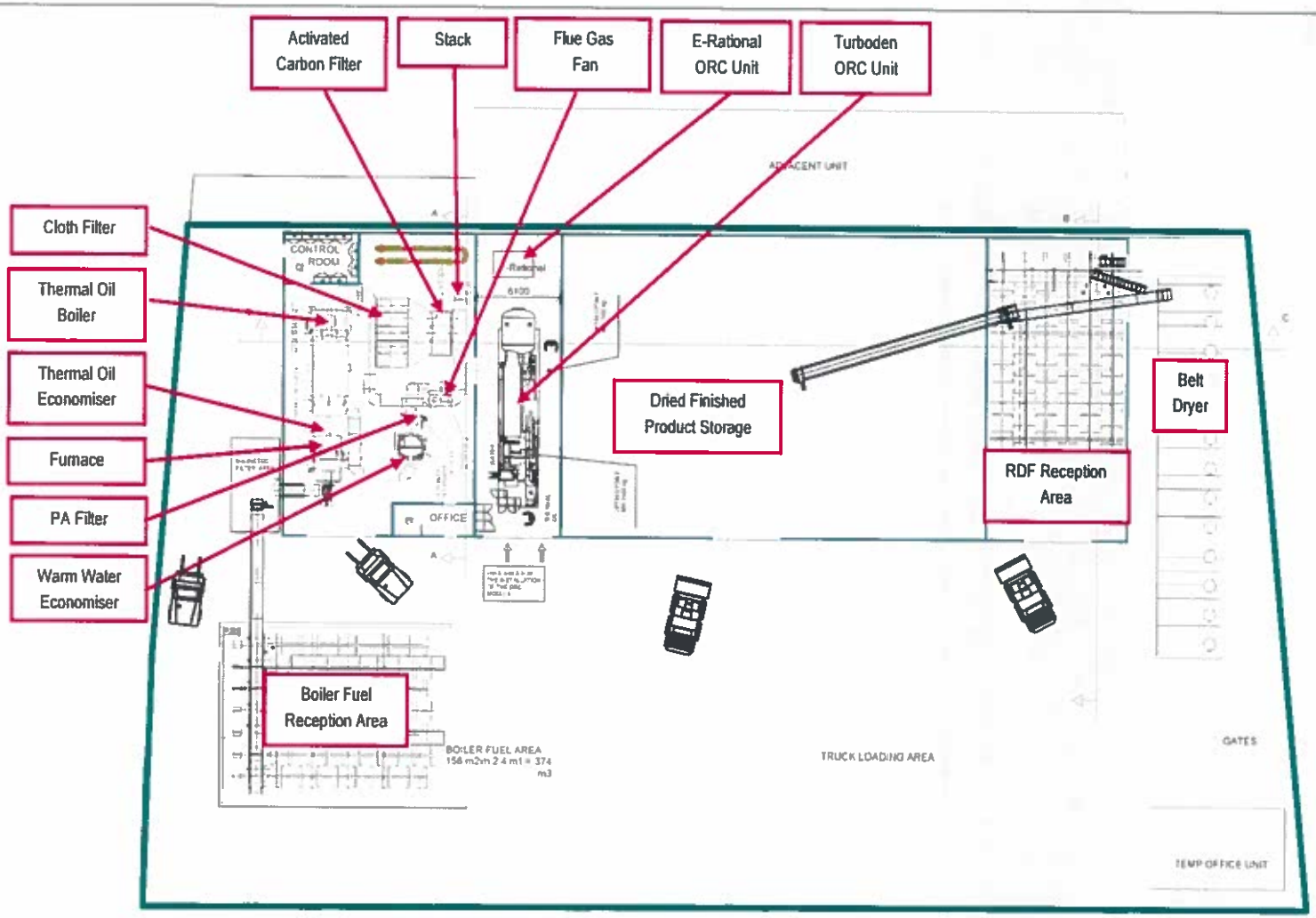

Figure 1.2: Installation Boundary

3. PROPOSED ACTIVITIES

3.1 Type of Permit

Renewable Asset Ltd (the 'Operator' or 'Applicant') are making an application for the operation of a Small Waste Incineration Plant Permit (SWIP) at their site in Hill Barton Industrial Park, Clyst St Mary.

The plant shall combust Grade B and C waste wood fuels and be used to generate renewable heat and power in an Organic Rankine Cycle (ORC) plant. Waste 'Low grade' heat will be used for waste drying on the behalf of the neighbouring Water Recycling and Recovery plant.

The facility will process approximately 14,000 tonnes per annum of Grade B and C mixed waste wood fuel feedstocks and be used to dry approximately 10,000 – 20,000 tonnes of Refuse Derived Fuels (RDF) .

Due to the plant being below the 3 tonnes per hour capacity thresholds stated in Section 5.1 Part A(1) of the EPR Regulations, the proposed development will be a Small Waste Incineration Plant. Due to the development not processing any of the wastes listed in Section 5.1 Part B of the EPR Regulations, the SWIP will be regulated only under EPR schedule 13A (IED Chapter IV) and will not be subject to Chapter II IED.

The SWIP has been designed to accept waste in accordance with stringent site waste acceptance procedures and agreed specification. All waste will be obliged to meet the specification provided in Table 3.2.

The applicant is making an application for an Environmental Permit to carry out the following listed activities;

Table 3.1: Activities

Activity listed in EPR Regulations 2013	Description of Specified Activity	Limits of Specified Activity	Specified Waste Management Operation
Small Waste Incineration Plant	A waste incineration plant or waste co-incineration plant with a capacity less than or equal to 10 tonnes per day for hazardous waste or 3 tonnes per hour for non-hazardous waste	The receipt and processing of clean woodchip to produce a homogeneous dried feedstock for thermal treatment. The thermal treatment of dried woodchip feedstocks. The use of ORC units to produce renewable energy and heat	R1: Recovery Waste R13: Temporary storage of wastes pending any other recovery operation. DDA – The receipt and drying of RDF for EMS Ltd DDA – Flue-gas clean up DDA – Renewable energy production via ORC units

The technical guidance notes used in the preparation of this application document are:

- EPR – The Treatment and Disposal of Non-Hazardous Waste (reference EPR 5.06); and
- EPR – How to Comply with your Environmental Permit (reference EPR 1.00).

3.4 Description of the Process

The principle components of the process comprise the following:

- *Waste Acceptance and Reception:* All waste woodchip fuels will be delivered directly into the boiler fuel store located adjacent to the main processing building.

  A separate RDF reception area has been provided for the EMS Waste Services drying activity. RDF will be delivered from the neighbouring facility directly into the buffer store for the dryer located within the main processing building.

  Although the waste drying activity takes place within the building operated by the Applicant, all RDF wastes remain under the ownership and responsibility of EMS Waste Services Ltd at all times. EMS Waste Services have existing waste specifications established for all materials to be processed at the site. No *'out of specification'* waste feedstocks will be processed on the site.

- *Drying:* All RDF will be delivered onto a walking floor system which will transport the RDF into a hopper on top of the dryer unit.

  The RDF will be conveyed into the Belt Dryer. The proposed Belt Dryer has a max thermal capacity of approximately 2,500kW$_{th}$. The heat for the dryer will be provided by the excess heat produced by the ORC unit's. Once dried, the RDF will be returned directly to the EMS Waste Services facility for further processing.

- *Combustion:* Grade B and C chipped waste wood feedstocks will be transferred from the boiler fuel store via a walking floor system directly into the feed conveyor of the combustion chamber oiler. The feedstock will enter the combustion chamber via a stoker unit which will screw the wood into the combustion zone of the boiler. The boiler is equipped with a hydraulic flat moving grate which burns the fuel. The grate is divided in three sections; a drying section, a primary combustion section and a secondary combustion zone where the combusted woodchip will undergo complete combustion and reduced to ash.

  The hot flue gases produced from the combustion chamber will be recovered in the heat exchanger (a thermal oil boiler and thermal oil economiser) which will feed the ORC unit.

- *Flue Gas Cleaning System:* Flue gases will exit the thermal oil boiler and enter the flue gas cleaning system which consists of a PA filter, cloth filter, Selective Non Catalytic Reduction (SNCR), active coal filter and lime injection system before being released via stack.

- *Electricity Generation:* In order to produce electrical power and usable heat, two ORC systems will be used. The first system will produce electrical energy through a thermal oil circuit. The second will produce electrical energy through the boiler sidewall pipe cooling / combined economiser water circuit.

A simplified process layout is provided in Figure 3.1 overleaf.

3.5 Raw Materials

Waste Feedstocks

The proposed development will accept approximately 14,000 tonnes of locally sourced Grade B and C[4] chipped waste wood per annum.

The site will also process dry under contract 10,000 – 20,000 tonnes of Refuse Derived Fuels (RDF) on the behalf of the neighbouring EMS Waste Services Ltd facility.

Prior to processing, all wastes accepted into the plant will be subject to stringent waste acceptance criteria in accordance with the Company's Environmental Management System and associated procedures:

- RA-E01 – Waste Pre-Acceptance;
- RA-E02 – Waste Acceptance; and
- RA-E03 – Waste Rejection.

The European Waste Catalogue (EWC) codes of wastes that will be accepted by the proposed development are provided in Table 3.2.

Table 3.2: Proposed Feedstock EWC Codes and Types

Waste Code	Description
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; would be typically used for any non hazardous waste wood packaging (pallets, packing timbers etc);
15	**WASTE PACKAGING; ABSORBENTS; WIPING CLOTHS, FILTER MATERIALS AND PROTECTIVE CLOTHING NOT OTHERWISE SPECIFIED**
15 01	**packaging (including separately collected municipal packaging waste)**
15 01 03	wooden packaging
17	**CONSTRUCTION AND DEMOLITION WASTES (INCLUDING EXCAVATED SOIL FROM CONTAMINATED SITES)**
17 02	**wood, glass and plastics**
17 02 01	paper and cardboard; would be typically used for any general non-hazardous wood emanating from building/construction sites;
19	**WASTES FROM WASTE MANAGEMENT FACILITIES, OFF-SITE WASTE WATER TREATMENT PLANTS AND THE PREPARATION OF WATER INTENDED FOR HUMAN CONSUMPTION AND WATER FOR INDUSTRIAL USE**

4 Grade B and C Waste wood is defined in BSI PAS 111: Processing wood waste as being Industrial feedstock and fuel grade materials

Process Consumables

Table 3.3: Raw Materials Summary			
Material	**Nature of storage**	**Location**	**Fate**
Wood	14,000 tonnes per annum	Stored in boiler fuel store	100% combusted with plant and equipment
Refuse Derived Fuels	10,000 – 20,000 tonnes per annum	Stored RDF reception area	Temporary reception, dried and transferred from/to EMS Waste Services Ltd under contract
Thermal Oil	Internal bunded oil tank approx. 5m³ All tanks will be installed with secondary containment and be designed to comply with the following standards and guidance requirements; – Environment Agency PPG2: Above Ground Oil Tanks. – CIRIA C958: Chemical Storage Tank Systems – Good Practice; – CIRIA R164: Design of Containment Systems for the Prevention of Water Pollution from Industrial Sites.	Internal	Contained within ORC unit. All oils reprocessed off site
Urea	32% urea Solution stored within 1000L IBC Approx. 450m³ per annum	Internal	Reacts with flue gas and discharged to atmosphere
Lime based reagent	Stored in FIBC Bulk bags Approx. 1000T per annum	Internal	Reacts with acid gases and discharged as FGCS residue from bag filter. All FGCS wastes will be transferred off site and reprocessed.

The internal layout of the building has been designed to conform with the requirements of EA TGN7.01 *'Storage of combustible products'*.

All incoming and outgoing delivery vehicles will be recorded via the weighbridge and all deliveries recorded accordingly.

3.7 Fuel Preparation

No fuel or waste treatment activities (shredding, baling, compacting, screening etc) will take place at site. All wood chip fuels will be used as delivered.

3.8 CHP Plant

Combustion Plant

The boiler is equipped with a hydraulic flat moving grate where all fuels are combusted. The grate is divided in three sections; a drying section, a primary combustion section and a secondary combustion section where the combusted woodchip will undergo complete combustion and be converted to ash.

Summary technical details of the combustion plant and hydraulic flat moving grate are provided in Table 3.4 below.

Table 3.4a: Grate Technical Details	
Grate Surface	10.8m²
Width Moving Grate (approx.)	1.4m
Length Moving Grate (approx.)	7.8m
Grate Material	Ni-Cr
Velocity Flue Gases Above Grate	5m/s
Table 3.4b: Furnace Technical Details	
Width (approx.)	2.4m
Length (approx.)	10.0m
Height (approx.)	5m
Residence Time Flue Gas	>2s
Weight Furnace	90 tonnes

The internal design of the combustion chambers have been designed to ensure that the Chapter IV IED temperature and residence time (850ºC / 2 seconds) requirements are met after the last secondary air inlet. The staged combustion of the plant ensures low carbon monoxide (CO) and Organic Carbon (TOC) concentration levels and to comply with the Emission Limit Values (ELV's) requirements of IED.

The combustion plant is installed with a water cooled jacket to provide thermal protection to the internal refractory brickwork against over-temperature conditions. The cooling jacket will be connected to the heat recovery system and will supply warm water into the system (providing a maximum of 525kW_{th} into the water system).

Figure 3.2: SWIP Unit

3.9 Flue Gas Clean Up

Flue gases exiting the combustion plant and thermal oil plant will be at approximately 300°C. Further thermal energy is recovered by a warm water economiser connected to the warm water system.

The flue gas cleaning plant is located behind the economiser and consists of a five stage air pollution control (APC) with associated forced draught and fan and ducting system comprising:

- Urea Injection into combustion chamber (NO_x reduction);
- Cyclone PA filter;
- Sorbent (hydrated lime) injection system; and
- Cloth 'baghouse' filter; Activated carbon filter (metals and VOC removal);

The cyclone PA filter is used to ensure that the dust emissions are below 150 mg/Nm^3. After the PA filter, lime is added to the flue gases to capture the acid gases. The amount of HCl present in the stack is measured and lime is added accordingly. The lime will then be captured by the cloth filter.

The cloth filter will be placed behind the flue gas fan to ensure an emission limit below <5 mg/Nm^2.

Selective Non Catalytic Reduction (SNCR) will be used in order to reduce NO_x emissions. A NO_x emission level of 200 mg/Nm^2 will be achieved by the injection of urea into the furnace. The furnace is designed in such a way that the combustion chamber remains temperature sub 1100°C to inhibit the formation of thermal NO_x.

The CHP unit will be operated at 100% capacity. Technical details of the ORC unit are provided in Table 3.6 below. An example of the ORC unit is shown in Figure 3.3.

Table 3.6: Turboden ORC Unit Technical Details

ORC Performance @ Partial Load	Design Specification Data
Partial Load	100%
Gross Electrical Power Output	643kW
Own electricity Demand of the ORC Module	32kW
Net Electrical Power Output	611kW
Thermal Power of Thermal Oil Transfer Media (HT Circuit)	3340kW
Type of Working Fluid	Turboden Power 1
Quantity of Working Fluid	1200kg

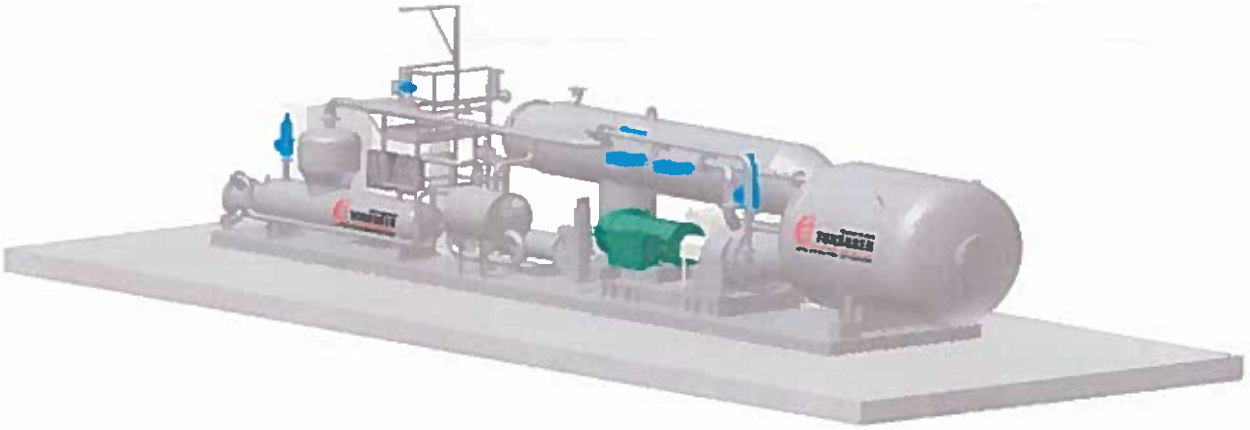

Figure 3.3: Turboden CHP ORC Unit

A second ORC unit (E-Rational Frame 1750/110 kWe) is fed with warm water retrieved from the furnace's side wall pipe cooling screen as well as from the flue gas economiser. The ORC output will be approximately 95kWe gross power / 84kWe net power.

The cycle starts at the pump, which pumps the working fluid to the evaporator. At the evaporator, the available waste heat is used to evaporate the fluid. The saturated gas at the outlet of the evaporator is then sent to the expander. The expansion of the gas drives the generator, resulting in the production of electricity. Supersaturated low pressure gas leaves the expander to be condensed in the condenser. The fluid leaving the condenser will be pumped up to restart the cycle.

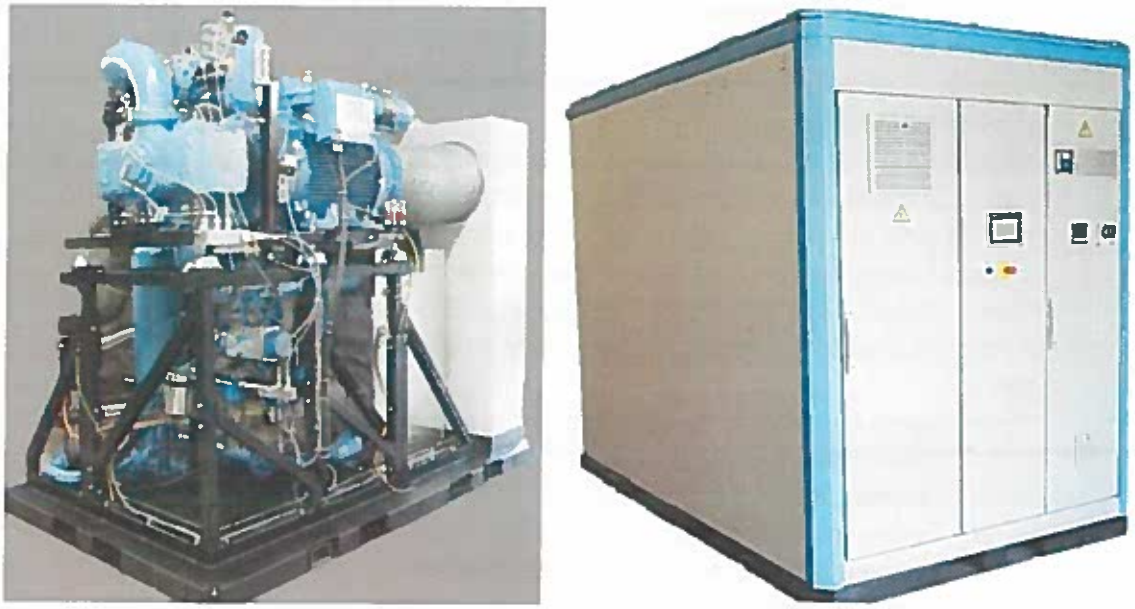

Figure 3.4: E-Rational ORC Unit

3.12 SCADA Control

The SWIP and all associated CHP ancillaries will be fully automated to the point that all process activities will be PLC controlled and SCADA monitored. The installation will have on-line monitoring which can be administered remotely to ensure the process is optimised and operating correctly.

The system monitors functions that communicates between PLC's and the controls of each individual system. It also comprises:

- 1 x data PLC for remote monitoring purposes;
- 1 x Kara furnace / system and fuel control and thermal systems;
- 1 x Kara gas cleaning system;
- 1 x remote emission monitoring;
- 1 x Turboden ORC generator;
- 1 x E-Rational ORC Generator;
- 1 x wood drier installation (including fuel feeds systems and moisture control measurement);
- Full control of header groups (pumps, regulation valves, temperature controls etc) including energy monitoring; and
- PC with a SCADA system of process control and overview.

3.13 Environmental Management System

The site will be operated in accordance with corporate standards and procedures as part of a wider Environmental Management System. The Environmental Management System will be structured to meet the requirements of the Environmental Permitting Regulations and associated pollution prevention guidance.

The EMS will be designed to ensure:

Working Plan

Renewable Asset will develop a working plan for the operation of the site. The working plan will define the management of the site and provide the management controls for all aspects of the site. Draft versions of these procedures are included in *Annex E – Draft Site Working Plan* and includes the following:

Table 3:8 Working Plan

Ref No:	Title	Purpose
RA-E01	Waste Pre-Acceptance	This procedure defines the upstream screening, checking and pre-acceptance of all incoming waste prior to its arrival on site.
RA-E02	Waste Acceptance	This procedure outlines the onsite controls and considerations that need to be applied when waste materials arrive on site for processing.
RA-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.
RA-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.
RA-E05	Waste Reception and Storage	This procedure outlines the waste reception, storage processes for all incoming waste.
RA-E06	Environmental Records	This procedure defines the necessary Environmental Permit and Waste Records that are required to be managed by the site to ensure compliance.
RA-E07	Environmental Management and Monitoring Programme	This procedure provides an overview of all of the necessary environmental monitoring procedures and controls to ensure compliance with the Permit.
RA-E08	Infrastructure Management and Monitoring Programme	This procedure provides an outline of the inspection and cleaning requirements for the site.
RA-E09	Accident Management Plan	This procedures refers to the sites emergency plans and response requirements.

3.14 Operator Competence

The facility will be fully automated to the point that all process activities will be PLC controlled and SCADA monitored. The facility will have on-line monitoring which can be administered remotely to ensure the process is optimised and operating correctly.

Notwithstanding the above, the site will be fully staffed during all operations.

The primary role of day staff is to ensure and oversee plant loading operations, fuel transfers and management.

Additional activities will include general site housekeeping and administration activities. Additional staff attending the site will be visiting engineers from the equipment manufacturers who are adequately trained to perform their duties at the site. The site will maintain written operation instructions all for the plant and monitoring equipment present on site.

All personnel working at the facility will be trained in the necessary sections of the Environmental Management System and all associated procedures.

Incident Reporting

The reporting of incidents and non-conformities will form a key component of the companies Environmental Management System. Identified non-conformities under the system include, but are not limited to the following:

- Uncontrolled leaks and spillages of any materials with the potential to cause pollution to the environment (hydraulic fluid/oils, unabated dust emissions to atmosphere);
- Non-compliance to any permitted condition or consent limit (emissions excursions, missing of reporting deadlines, breach of any permitted consent limits;
- Internal Audit findings (legal non-compliances, EMS procedural breaches, system non-compliances);
- External and Internal Complaints; and
- Whenever a plant malfunction, breakdown or failure, or any near miss occurs.

The company's EMS will undergo periodic external audit and review to ensure that both compliance and continuous improvement is achieved. The EMS requires that all identified incidents and non-conformities will be investigated and closed out.

All plant and equipment will be PLC controlled, monitored and alarmed using a 'SCADA' system, thus ensuring that continuous plant diagnostics can be facilitated.

Furthermore, the site management system will have documented procedures and registers to:

- Ensure that any members of the public/residents are alerted and informed if a significant plant issue arises (fire, explosion etc);
- Record, report and investigate any internal or external complaints to ensure that any necessary measures are taken to prevent, or where that is not possible to minimise, the causes; and
- Inform any members of the public about the nature of the site, key contacts and sources of further information.

Group I (Cd, Tl)	1.56×10^{-4}	1.56×10^{-4}
Group II (Hg)	1.56×10^{-4}	1.56×10^{-4}
Group III (Sb, As, Pb, Cr, Co, Cu, Mn, Ni, V)	1.56×10^{-4}	1.56×10^{-4}
Dioxins and Furans	3.12×10^{-10}	3.12×10^{-10}
PAH as B[a]P	3.12×10^{-6}	3.12×10^{-6}
PCB	1.56×10^{-5}	1.56×10^{-5}
(a) Reference conditions: 273K, 11% O_2, dry, 101.3kPa		

Detailed emissions modelling to full IED requirements has been carried out as part of this Application.

All details are provided within *Annex C – Air Quality Assessment.*

4.2 Emissions to Controlled Water

There will be no emissions to controlled water arising from the proposed development.

4.3 Emissions to Sewer

There will be no emissions to sewer from the proposed development.

4.4 Emissions to Land

There will be no emissions to land arising from the proposed development.

4.5 Odour

There is no odour potential associated with the supply, receipt, storage and combustion of the Grade B and C mixed waste wood feedstocks proposed to be combusted. These materials are by their nature, stable and non-reactive and non-odourous.

All materials being transferred and processed through the dryer will also have a low odour potential. All waste processing will take place either within the enclosed main processing building or the enclosed belt dryer unit. No external processing will take place and no external emissions will be released.

No odorous materials will be accepted onto site and therefore the potential for offsite odour impacts is considered negligible.

Due to the nature of the material processed by the plant and the sealed processing building and belt dryer unit, there will be no anticipated odour impacts associated with the operation of the plant.

A review of the odour control measures has been provided in Table 4.2.

Table 4.2: Odour Management Summary

Tier	Reference	Description
1	Inventory Control	The Installation will process 14,000 tonnes of chipped waste wood per annum through the boiler plant, and 10,000 – 20,000 tonnes of RDF per annum through the dryer plant. Grade B&C Mixed Waste Wood is not considered to be odourous.

Table 4.3 Identified Noise Sources and Abatement

Equipment	Description	Location of Source	Nature of Noise	Duration of Noise	Abatement Fitted	Significant Impact at Receptor
Transportation and external vehicle movements	Vehicle engine and drive-train noise	Along access roadways and site entrance	Intermittent occasional impact noises due to 'road bumps'. Only one vehicle per day will deliver wastes to the site	Short Term	Road will be maintained in good order. All vehicles requested to observe site speed limits. Site layout has been elected to screen transportation noise as much as practicably possible.	No, the deliveries and collection of waste will be limited to daytime hours only. Minimal vehicle deliveries.
Reception and delivery	Internal and external vehicle noise, hydraulic and fan plant noise	Internal	Intermittent vehicle engine noise	Intermittent	Yes – building is sealed and has limited protrusions, vents etc. Vehicle deliveries will only take place during daytime hours.	No, all reception activities will be carried out internally. Building is treated to prevent noise break out. No deliveries will be carried out during night-time periods.
Dryer	Tonal plant noise	Internal	Intermittent tonal plant noise	Periodic	All drying plant is fitted with acoustic treatment	No, the building is treated and sealed to prevent noise outbreak
Furnace	Combustion fan and burner noise	Internal	Continuous tonal plant noise	Continuous	All plant is fitted with acoustic treatment and draws the combustion air from internal sources.	No, the building is treated and sealed to prevent noise outbreak
ORC units	Tonal plant noise	Internal	Continuous tonal noise – fitted with attenuation	Continuous	ID fan and associated equipment fitted with acoustic housing. All exhausts attenuated to be inaudible at the installation boundary	No, all aspects of the external services will be acoustically treated.

5. ENVIRONMENTAL MONITORING

5.1 Emissions to Air

Any changes in the flue gas composition will be monitored and controlled in accordance with the process logic of the SCADA systems.

The plant will have a continuous emission monitoring system (CEMS) located of the exhaust flue (Emission Point A1). The CEMS will be either a SICK or a CBISS system.

The CEMS will continuously monitor:

- Total Dust;
- Total Organic Carbon;
- Oxides of Nitrogen;
- Sulphur Dioxide;
- Hydrogen Chloride;
- Hydrogen Fluoride;
- Carbon Monoxide;
- Oxygen;
- Pressure;
- Temperature;
- Water Vapour Content; and
- PAH.

The continuous monitoring equipment will operate on a 24 hour basis and will include the facility for on-line monitoring of the gas concentrations and provide for any out-of-tolerance indicators to be monitored by remote staff.

All CEMS equipment and associated platforms and sampling ports installed on site will meet the requirements of the Environment Agency Technical Guidance Note M2. All CEMS equipment shall be MCERTS approved.

Procedures will be created for monitoring undertaken at the site. These procedures will confirm to M1 and M2 guidance and those required by the operator monitoring and assessment scheme and are incorporated into the sites EMS system.

5.2 Emissions to Controlled Water

There are no point source emissions to controlled waste arising from the process. Therefore, no monitoring is required.

5.3 Emissions to Sewer

There are no point source emissions to sewer arising from the process. Therefore, no monitoring is required.

5.4 Emissions to Land

There are no point source emissions to land arising from the process. Therefore, no monitoring is required.

6. IMPACT TO THE ENVIRONMENT

6.1 Impacts to Air

An assessment has been carried out to determine the potential air quality impacts associated with the proposed SWIP and CHP Facility.

The initial assessment was carried out following methodologies and guidance provided by the Environment Agency's H1 assessment model.

Scope of the Assessment

The scope of the assessment has been determined in the following way:

- Review of air quality data for the area surrounding the site, including data from the DEFRA Air Quality Information Resource (UK-AIR);
- Desk study to confirm the location of nearby areas that may be sensitive to changes in local air quality; and
- Review of emission parameters used as input to the AERMOD 7 dispersion modelling assessment. Undertaken to predict the impacts associated with the stack emissions from the plant.

The assessment for the proposed development comprises a review of emission parameters for the plant and dispersion modelling to predict ground-level concentrations of pollutants at sensitive human and habitat receptor locations.

Predicted ground level concentrations are compared with relevant air quality standards for the protection of health and critical level / loads for the protection of sensitive ecosystems and vegetation.

This modelling is presented within *Annex C – Air Quality Assessment.*

6.2 Sensitive Human Health Receptors

Specific receptors have been identified where people are likely to be regularly exposed for prolonged periods of time (e.g. residential areas). The location of the discrete sensitive receptors is presented in Table 6.1 below.

- Ancient woodland.

There are no nationally or locally designated sites within 2km of the site. However, there are several European sites within 10km of the site. These include the following:

- Exe Estuary Ramsar Site and SPA;
- East Devon Pebblebed Heaths SAC; and
- East Devon Heaths SPA.

The report concludes that the predicted process contributions are of negligible significance compared with the critical levels and critical loads for exposure to airborne concentrations, nutrient nitrogen deposition and acidification.

Please refer to *Annex C – Air Quality Assessment* for more information.

6.4 Impacts to Land

There are no impacts to land relating to the proposed Installation.

6.5 Impacts to Controlled Waters

There will be no process effluents discharged to controlled waters from the Installation.

6.6 Impact to Sewer

There are no discharges to sewer arising from the proposed Installation.