Further Cleanpower NDM Questions to clarify number of STU's in Installation

The site layout plan provided in the Application (Drawings 3.3 and 3.9) is inconsistent with some schematics and narrative sections of the application and the subsequent Not Duly Made response. In order to provide clarification of this issue and to establish the number of Stationary Technical Units within the installation, please provide further information as requested below.

1. Please provide a revised site layout plan, confirming how many pieces of each item of equipment are employed. This should clearly show each functional piece of equipment from material feed to pyrolysis units, char discharge, char burners, HRSG and filtration. Also identify each part of the raw syngas clean-up plant, gas storage and spark ignition engines.
   The revised plan and an accompanying description should provide further details of the treatment/processing of the waste which is output from the autoclave units prior to its storage ready for input to the pyrolysis retort vessels.

2. Please confirm that the flue gas exhaust from each of the char burning units provides heat to their corresponding pyrolysis unit, then into a single flue gas collection manifold to a single HRSG prior to passing to the abatement system for these flue gasses.
   If this arrangement is not part of your proposal, please provide a further detailed description with an appropriate support diagram.

3. Please confirm that the output raw syngas from each of the four pyrolysis retort vessels is conveyed and processed through a single common integrated gas cleanup plant.
   If this arrangement is not part of your proposal, please provide a further description of the syngas cleanup arrangement with an appropriate support diagram.

4. Please confirm that the residual 'char' discharged from the pyrolysis retort vessels identified in point 1 above is collected and processed through a single common pulverising unit and then collected in a common storage facility before being subsequently distributed as energy source material to the four char burning units.
   If this arrangement is not part of your proposal, please provide a further description of the char processing arrangements with an appropriate support diagram.

5. Please confirm that the pre-treated waste from the earlier stages of the process is stored in a common storage facility awaiting input to the pyrolysis stage of the process.

If this arrangement is not part of your proposal, please provide a further description of the ‘biofibre’ storage and feed arrangement to the pyrolysis retort vessel units with an appropriate support diagram.

Mr. Steve Butler
Sol Environment Limited
2nd Floor
10 The Lees
Malvern
Worcestershire
WR14 3HT

Our ref: EPR/FP3639ZD/A001

Date: 27 February 2014

Dear Mr. Butler,

We need more information about your application

Application reference: EPR/FP3639ZD/A001
Operator: Clean Power (UK) Limited
Facility: Micheldever Energy Recovery Centre, Overton Road, Micheldever Station, Winchester, Hampshire, SO21 3AP

Thank you for your application received on 24/01/2014.

I need to ask you for some more information before I can do any more work on it. Please address the following points:

1. Extent of Installation

Clarification is needed on the extent of the installation in respect to the number of 'stationary technical units' (STU) that are considered to be within it.

(i) The Application states that "the pyrolysis plant" comprises of a single technical unit containing four rotating chambers/retorts. However -

- The application describes 4 retorts, but fig 3.9 appears to show 2 units, please clarify. Is there any occasion where only unit 1 or unit 2 can run independently?
- Are individual vortex solid fuel burner system(s) and thermal oxidiser(s) aligned to specific rotating chambers/retorts? How many of each are there? Does each vortex solid fuel burner system and/or thermal oxidiser discharge through separate abatement systems and flue? Provide a process flow diagram which clearly identifies each piece of equipment which makes up the plant, showing input material and syngas flow through each piece of equipment.
- Describe the char burning, thermal oxidiser, flue gas stream, flue gas treatment system and final flue gas discharge arrangements in more detail (including a schematic diagram that shows the flue gas flow system from the char burning appliances).

(ii) You state that stack 1 will comprise two internal flues (A1 and A2) corresponding to each of the pyrolyser ceramic filtration units in the non-technical summary. Table C1 in Appendix C specifies the stack modelling input data. The stack diameter has been reported as four 0.60 metre stacks within one wind shield- please clarify.

(iii) Please confirm, is the main purpose of the autoclave units is to pre-treat the incoming waste material prior to further thermal treatment processing in the pyrolysis chambers/retorts or to recover recyclables?

(iv) There are references to "ceramic filters" and "baghouse plant" for particulate removal in the application. Confirm whether ceramic or fabric filters are to be employed.

2. Section 5a, Part B3 of the application form – EIA

This part of the application form was not completed. Please complete and confirm the current Planning Application status for this development. Please then submit a copy of the EIA or planning permission and committee decision and report as appropriate. .

3. Noise impact assessment

Provide electronic copies of the model input files that were used for the Noise Impact modelling study.

4. Site plan

Fig 1.2 in the main application document shows the proposed site plan for the Installation.

- Provide a revised consolidated site plan (Fig 1.2) which includes all emission points to air (A1 to A6) and surface water (W1) and sewer (S1). The boundary of the site plan should be marked in green, with a compass marker and scale indicator.

5. Monitoring

Please clarify the number of continuous emissions monitors proposed for A1 and A2. As you have stated four flues within stack 1, does this correspond to four CEMS?

6. Emergency flare

Confirm the stack height of the emergency flare.

7. . Environmental Management System

The application makes reference to "*Crapper & Sons*". Please explain this discrepancy.

8. NOx abatement

The application (see page 52) makes reference to selective catalytic reduction (SCR) and selective non-catalytic reduction (SNCR) proposed for the gas engines and pyrolysis plant. Clarify the specific NOx abatement system proposed for the gas engines and pyrolysis plant.

9. Site drainage plan

. Please submit a site drainage plan detailing process water and surface water collection and discharge arrangements.

10. Opra

We believe the location attribute in the OPRA spreadsheet is incorrect. Our assessment shows that there is human occupation with 100 metres of the site. Provide a revised OPRA spreadsheet which includes an amended location attribute. In addition, provide an amended Part F1 of the application which takes into account the revised charges. (Also see 'Charges' below)

11. Charges

Be advised that if your answer to question 1 shows that the OPRA complexity score needs to be amended, then we will require the resulting further additional fee before we can duly make the application.

12. Advertisement fee for a Site of High Public Interest

We consider this application to be a Site of High Public Interest (SHPI). Therefore in addition to the OPRA charging considerations above, please include an additional payment element of £500 as part of the Application Fee resolution. This Fee element is in respect to the cost of advertising your application in the Local Press in this circumstance, and is as detailed in our Charging Scheme Guidance.

Please reply by 14 March 2014. If we don't hear from you we must return your application and fee.

If you email or write to us please quote the application reference **EPR/FP3639ZD** on any correspondence and send it to the relevant address below.

When we receive the missing items we'll continue to check the details in your application. If there's enough there for us to begin the process of deciding whether or not we can grant your application we say the application is 'duly made' and we'll let you know this by letter.

Please quote our reference if you contact us. If you have any questions please phone **Phil Kelkin** on **0121 712 9512** or email Philip.kelkin@environment-agency.gov.uk.

Yours sincerely

Thomas Lambert
Permitting Support Advisor

Sol Environment Limited
2nd Floor, 10 The Lees, Malvern
Worcestershire, WR14 3HT

t. +44 (0) 1684 572727
enquiries@sol-environment.co.uk

Phil Kelkin
Senior Permitting Officer
Environment Agency, PSC
Quadrant 2, 99 Parkway Avenue,
Sheffield, S9 4WF

15th April 2014

Our Ref: SOL0613CPP03_MD

Dear Mr Kelkin,

RE: CLEANPOWER (UK) LTD – Micheldever Energy Recovery Centre (EPR/FP3639ZD/A001)

Further to your email dated 4th April 2014, please find below our formal responses to each of the questions in turn.

1. Please provide a revised site layout plan, confirming how many pieces of each item of equipment are employed. This should clearly show each functional piece of equipment from material feed to pyrolysis units, char discharge, char burners, HRSG and filtration. Also identify each part of the raw syngas clean-up plant, gas storage and spark ignition engines.

The revised plan and an accompanying description should provide further details of the treatment/processing of the waste which is output from the autoclave units prior to its storage ready for input to the pyrolysis retort vessels.

The table below provides an overview of the key functional equipment located on site. This table should be read in conjunction with the updated site figure (Appendix 1). Please note that this plan does not include all minor plant, conveyor plant, duct work and internal tanks hoppers but does provide the key layout information of the main plant components and major ancillaries.

Table 1: Key plant and Equipment

Reference	Description	Comment
Z1–1	Air Lock 1	All air locks are automatically controlled as part of the building management system
Z1–2	Air Lock 2	
Z1–3	Air Lock 3	
Z1-4	AD Reception Vessel and Macerator	This is a single 40m^3 macerating pit with an automatic sealing lid into which all pure food waste is tipped. Material is directly pumped via Seepex pump to the primary anaerobic digestion tanks.
Z1-5	Autoclave 1 loading conveyor	Mobile conveyors for autoclave loading. Conveyors protruded through small wall aperture fitted with fire shutters and air knife.
Z1-6	Autoclave 2 loading conveyor	
Z1-7	Shredder	Shredder plant for use with oversize items when required
Z1-8	Walking floor conveyor	50 Tonne walking floor conveyor for transfer of the steam sterilised autoclaved mixed wastes.
Z2-1	Autoclave 1	20 Tonne capacity horizontal rotating autoclave
Z2-2	Autoclave 2	

Z2-3	Walking floor conveyor	50 Tonne walking floor conveyor for transfer of the steam sterilised autoclaved mixed wastes. All transfer systems are enclosed and extracted to pyrolysis thermal oxidisers
Z2-4	Steam recovery plant / accumulator	Steam recovery and generation plant for autoclave plant. All steam recovery and extraction systems are routed via a dedicated thermal oxidiser unit.
Z2-5	Water treatment plant and tank farm	Proprietary packaged plant for the pH control and treatment of recovered condensate. All vents from WWTP are routed to the pyrolyser thermal oxidiser unit
Z2-6	MRF plant and conveyor plant	This plant comprises: • Manual picking; • Trommel screen; • Star screen; • Eddy current separation; • Magnetic separation; • Optical separation • Density separation; and • Vibration tables. All conveyors systems are enclosed and fitted with extraction.
Z2-7	Chilling / cooling plant	Proprietary air blast chiller located in acoustic housing.
Z3-1	Combined Pyrolyser Feed system	Plant comprises of main 'bio-fibe' storage hopper discharging onto common enclosed feed conveyor to each retort. Conveyor systems fitted with enclosed extraction to thermal oxidiser plant.
Z3-2	Pyrolyser Plant	Main pyrolyser comprising four individual retorts working of a 25% capacity each basis. The combined capacity of the retorts is 12 dry tonnes per hour of recovered biomass fibre from autoclave plant
Z3-3	Common Char Handling Plant 1	Single char handling plant for processing 2 retorts. Interconnected to Char Handling Plant 2.
Z3-4	Common Char Handling Plant 2	Single char handling plant for processing 2 Retorts. Interconnected to Char Handling Plant 1.
Z3-5	Heat Recovery Bank 1	Heat recovery exchanger for Retorts 1 & 2, connected to common autoclave steam storage and recovery plant for all retorts
Z3-6	Heat Recovery Bank 2	Heat recovery exchanger for Retorts 3 & 4, connected to common autoclave steam storage and recovery plant for all retorts
Z3-7	Flue Gas Abatement 1	Interconnected Sorbent Injection and Ceramic Filtration Plant (1 of 2)
Z3-8	Flue Gas Abatement 2	Interconnected Sorbent Inject Plant and Ceramic Filtration Plant (2 of 2)
Z3-9	Common Flare	Flare system connected to common syngas treatment plant
Z3-10	Shared Pyrolyser Flue Stack	Single stack containing shared flue systems from ceramic filtration Plant 1 and 2
Z3-11	Common Gas Treatment Plant	The gas treatment plant comprises

		• Single dolomite tower; • Ceramic Filtration; and • Wet-scrubbing
Z4-1	Gas Engine 1	Single Rolls Royce V16 gas engine configured in an N +1 basis.
Z4-2	Gas Engine 2	
Z4-3	Gas Engine 3	
Z4-4	Gas Engine Flues	Multiple flue

Note: Items not specifically shown on diagram include, individual storage tanks, high level plant, extraction systems, small and medium size ductwork, valves and pipework, control systems and mobile equipment.

2. Please confirm that the flue gas exhaust from each of the char burning units provides heat to their corresponding pyrolysis unit, then into a single flue gas collection manifold to a single HRSG prior to passing to the abatement system for these flue gasses.

If this arrangement is not part of your proposal, please provide a further detailed description with an appropriate support diagram.

We can confirm that the abatement systems for all char combustion units are interconnected and essentially acting as a single unit with a capacity to operate at 50% capacity if required. The heat recovery boilers are arranged in two banks and each serve a pair of char combustion units, before entering into the combined abatement plant. Both heat recovery steam boilers are then interconnected to a single common steam generation plant that forms part of the main autoclave plant.

3. Please confirm that the output raw syngas from each of the four pyrolysis retort vessels is conveyed and processed through a single common integrated gas cleanup plant.

If this arrangement is not part of your proposal, please provide a further description of the syngas cleanup arrangement with an appropriate support diagram.

We can confirm that all synthesis gas from the plant is passed from the retorts into a common integrated gas clean up plant, prior to discharging to a single buffer storage vessel.

4. Please confirm that the residual 'char' discharged from the pyrolysis retort vessels identified in point 1 above is collected and processed through a single common pulverising unit and then collected in a common storage facility before being subsequently distributed as energy source material to the four char burning units.

If this arrangement is not part of your proposal, please provide a further description of the char processing arrangements with an appropriate support diagram.

The char combustion units share a common interconnected char handling system, located between each pair of char combustion units (thermal oxidisers). The two units are interconnected with duct work to transfer pulverised char between the units as required.

5. Please confirm that the pre-treated waste from the earlier stages of the process is stored in a common storage facility awaiting input to the pyrolysis stage of the process.

If this arrangement is not part of your proposal, please provide a further description of the 'biofibre' storage and feed arrangement to the pyrolysis retort vessel units with an appropriate support diagram.

We can confirm that all recovered 'biofibre' is stored in a common storage and the fed via a common feed system to the individual retort feed screws. The location of the fibre feed systems is provided within the updated site figure.

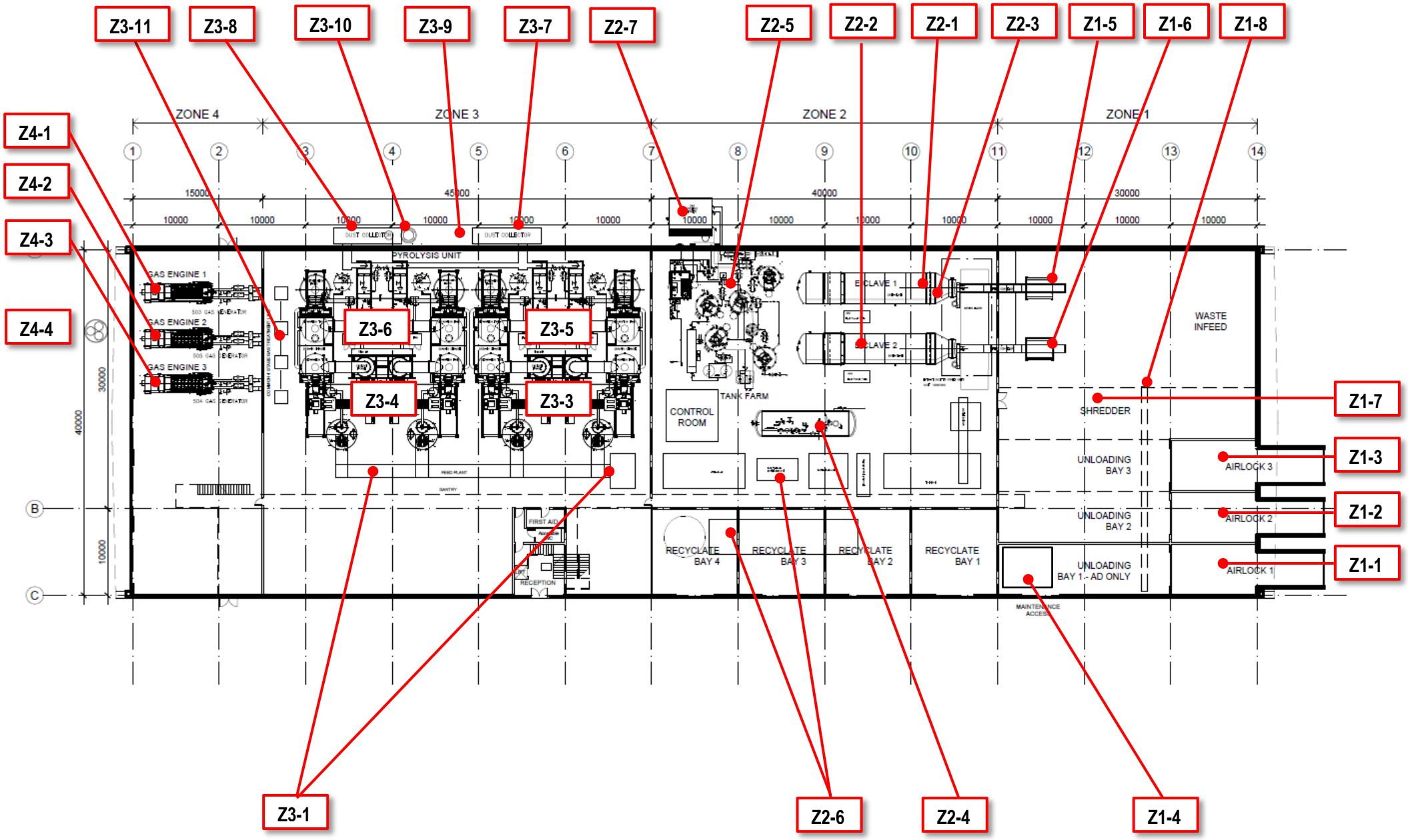
We hope that this response allows you to now duly make the Micheldever EPR application. Please note that for the sakes of clarity we will be providing an updated EPR Application Support Document (Volume 1) which includes all of these issues and provides a higher degree of consistency regarding the plant.

Should you have any further information requests or questions please do not hesitate to contact me.

Yours sincerely,

Steve Butler

APPENDIX 1: INTERNAL LAYOUT PLAN



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	APR 14	Original

Client:	CLEANPOWER PROPERTIES LTD	**Job No:**	SOL0414CPPL_01	**Drawing No:** CPPL01	**Revision:** 0
Project:	MCHELDEVER PERMIT APPLICATION	**Date:**	15/04/2014		
Drawing Title:	INTERNAL PLANT LAYOUT	**Drawn By:**	STEVE BUTLER	**Scale:**	NTS

Sol Environment Ltd
2nd Floor,
10 The Lees, Malvern,
Worcestershire WR14 3HT
t: +44(0)1684 572727
e: enquiries@sol-environment.co.uk
www.sol-environment.co.uk

Pyrolysis Unit Operations:

The pyrolysis unit has been designed to operate as a single unit with the maximum capacity of 12 (dry) tonnes per hour. The pyrolysis unit has four rotating retorts, each of which assume a 25% load of the plant.

This configuration allows for a very high degree of modulation (0-25% - 1 retort, 25-50% - 2 retorts, etc) whilst still maintaining an ability to carry out operational maintenance without necessitating the need to shut down the entire plant.

The pyrolysis unit is serviced by a series of common ancillaries, each of which has been specified with an adequate level of redundancy (modular plants with a duty/standby etc) to allow for partial shutdown of the plant, should there be a requirement to maintain the equipment or operate at a lower capacity.

The common ancillaries include the pyrolysis unit feed conveyors systems, the heat recovery systems, syngas clean up, pyrolysis unit emissions abatement and ductwork systems. The entire system is served by a single induced draught fan which is located at the base of the main exhaust stack. The pyrolysis unit exhaust system is a common system which splits into two ducts just upstream of the two ceramic filtration plants and joins again prior to the intake of the main fan and SCR plant.

Through the use of actuated dampers, the flue emissions can be routed through either filtration unit, each filtration unit has sufficient capacity to treat 100% of the plant exhaust. Again a split system is the preferred choice as it allows for a very high range of operational flexibility depending on the specific load requirement of the pyrolysis unit, as well as providing a very high level of redundancy should any aspect of the filtration plant need to undergo repair or maintenance.

Vaporo Tech have previously provided details of all of the key ancillaries that apply to the pyrolysis unit and therefore the specific detail is not repeated.

Exhaust Fan

The exhaust stack for the plant has been designed with two internal flues, housed within a single windshield.

This configuration allows the ID fan to modulate in accordance to the pyrolysis unit demand without having a detrimental effect on the efflux velocity. The system works on the principle that as the system modulates to below 50% airflow one of the actuated dampers fitted to the base of each flue will close such that all emissions are preferentially exhausted from a single exhaust flue.

The ID fan has been designed on a ‘duty/standby’ basis. All WID CEMS plant is located in the common duct downstream of the NOx Catalyst and upstream of the ID Fan intake.

The following page has a graphic depicting the Pyrolysis Unit Exhaust system.

SIMPLE PYROLYSIS UNIT EXHAUST SCHEMATIC