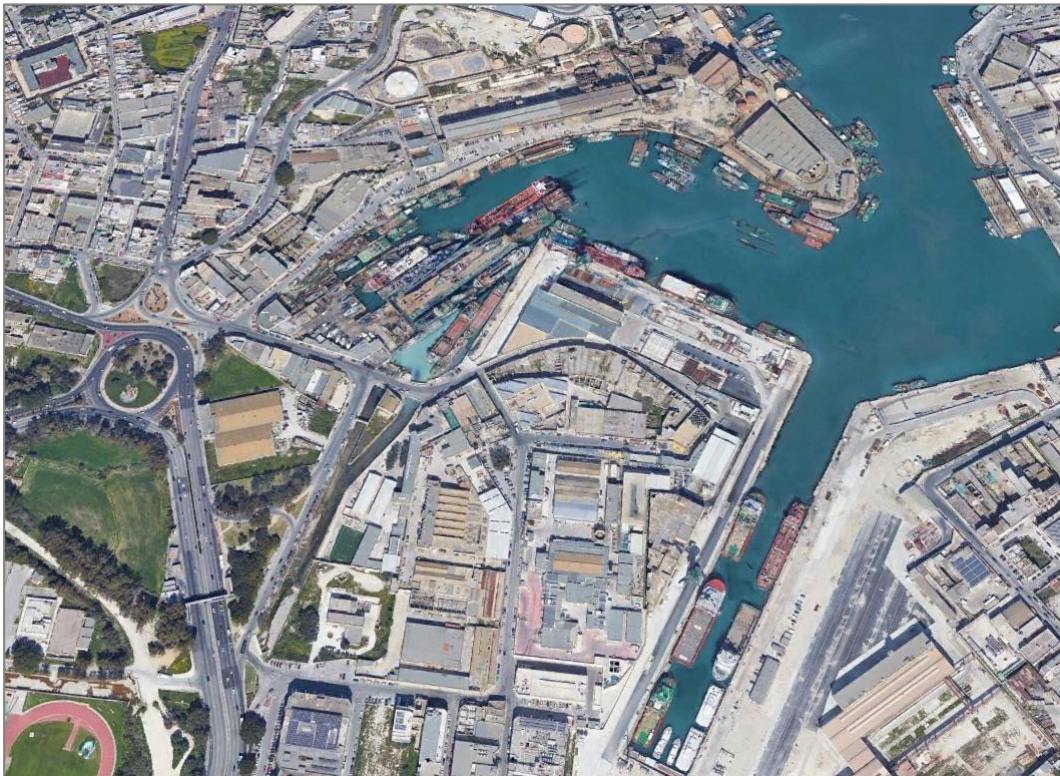


MARSA THERMAL TREATMENT FACILITY

**Application for Variation of IPPC permit
IP 0004/07/C to resume Autoclave Operations, to
introduce Odour Abatement Techniques, to erect
Marshalling Shed, and to use of Dual Fuel Burner**



(source: Google Maps)

1. Introduction and Context

1. The Marsa Thermal Treatment Facility (MTTF) consists of a waste management facility originally designed for the treatment of abattoir wastes, that was eventually adapted to treat a specific range of clinical and other hazardous wastes. The facility currently includes the following specified activities (or directly associated activities as defined under the IPPC regulations) as specified under IP 0004/07/C:
 - Incinerator or waste incineration plant, from the receipt, temporary storage and incineration of specified wastes, together with the flue-gas treatment, and temporary storage on site of residues generated;
 - Waste heat recovery boiler and economiser, for heat recovery;
 - Diesel tank farm, to store fuel for on-site use;
 - Blood coagulator for the sterilisation of blood, and separation of blood coagulum from water;
 - Wastewater treatment plant, for treatment of waste waters on site;
 - Autoclave intended for treatment of animal by-products received on site – temporary not functional, pending repairs; and
 - Diesel generators to generate electric power in case of electricity failure.

The above facilities are described in previous IPPC applications and in the Environmental Impact Statement.

2. This plant was first approved in January 2006 by approval of development permit PA 2201/01, 'to install an incineration unit and adjacent cold store within incineration site at Public Abattoir to meet E.U standards'; the IPPC permit IP 0004/07 allowed its operation in October 2007. Additional permits on site included:
 - PA 3201/07 for stores and laboratory, decided concurrently with PA 2201/01;
 - PA 2585/13 for the 'Construction of an autoclave as an ancillary to the MTTF', decided in August 2014;

The operation of the autoclave was permitted via the issuance of IPPC permit IP 0004/07/B in April 2016, which also considered the variation in terms of change in site boundary, variation to the list of permitted wastes, waste delivery times, and waste acceptance procedures.

2. Scope of Application & Non-Technical Summary

3. This application is a request for variation to the current permit to resume Autoclave operations, introduce odour abatement equipment, erect a marshalling shed, use a dual fuel burner and to revise the list of waste permitted on site as per EWC codes.
4. Before proceeding further, it is worth pointing out recent PA applications of interest:
 - PA 02303/21 for the construction of a shed to enclose the waste marshalling area at the incinerator in Marsa Thermal Treatment Facility
 - PA 08829/21 for the installation of an air treatment plant at Wasteserv's Thermal Treatment Plant.

Refer to Annex 03 for more details.

5. Barring no unforeseen issues, autoclave operations shall resume in Q1 2023. Following the fire incident in October 2020, repairs have been coordinated and are being effected. Plant side panels have been installed. The existing boiler has been decommissioned and shall be replaced by a new one. The LPG tank, previously used to feed the boiler, shall be decommissioned. In fact, two LPG tanks shall be commissioned to feed both boiler and RTO. Equipment specifications are attached in Annex 06.
6. Autoclave by-products, namely tallow and bone meal, shall be traded on the market with the objective of introducing these products into the economy. Such initiative is preferable for it moves the products away from the disposal route towards reutilisation. WasteServ is in contact with the Veterinary and Phytosanitary Regulation Division (VPRD) to establish requirements.
7. The new odour abatement equipment at the TTF consists of: a Regenerative Thermal Oxidiser (RTO) and a Positive Pressure Ionisation Systems (PPIS).
8. The RTO shall treat the odour resulting from the autoclaving process, particularly the rendering and the pressing. Odorous air is directed to the RTO in which it is heated and oxidized, and thereafter emitted from a stack. Another feed to the RTO, is the air in proximity of the heating unit, the latter used to heat the tallow prior to it being pumped and directed to the dual burner.

9. The PPIS shall produce ionised air that shall neutralise odorous air from the Incinerator's Marshalling Shed and Shredder Room, and also the Autoclave's Shed.
10. The Marshalling Shed is built over, and it encapsules, the zone known as the Marshalling Area where slaughterhouse waste and animal carcasses are temporarily stored upon arrival at the Incinerator. The shed shall provide closure and protection from the elements, particularly direct sunlight, thus avoiding accelerated waste decomposition and associated odour. As stated above, the Marshalling Shed shall be receiving ionised air from the PPIS, thus mitigating odours in the said shed.
11. This application also introduces the use of a dual fuel burner. The burner and associated ancillaries shall enable the ignition of both heating fuel oil and tallow generated from the Autoclaving process.
12. In order to increase operational flexibility, WasteServ shall keep the option of utilising tallow as fuel in the Incinerator's kiln. The use of tallow as a fuel is in line with WasteServ's tagline 'Creating Resources from Waste' and is consistent with the Circular Economy concept. The use of tallow has the potential to offset Heating Fuel Oil consumption by 367,325 litres yearly (refer to Annex 13).
13. The application for variation includes the following documentation as annexes:

Annex 01:	IPPC Application Forms
Annex 02:	Company Registration Certificate
Annex 03:	Existing Permits
Annex 04:	Improvement Programme Update
Annex 05:	Site Plan
Annex 06:	Specifications & Drawings
Annex 07:	Process Flow Diagram
Annex 08:	Maintenance Plan
Annex 09:	BAT Comparison
Annex 10:	ERP
Annex 11:	EWC Codes
Annex 12:	Decommissioning Instructions
Annex 13:	Fuel Savings
Annex 14:	Medium Combustion Plant
Annex 15:	Study on the Noise Emissions from MTTF

3. Timeline

The timeline for implementation is captured in Table 2 below.

Operation	Timeframe	Status
Erect a marshalling shed	June 2022	Completed
Use a dual fuel burner	January 2022	Completed
Introduce odour abatement equipment: <ul style="list-style-type: none">• RTO• AHUs	February 2023 January 2023	Completed Completed
Initiation of Autoclave operations	Mid-May 2023	In progress

Table 1

4. Technical Details

14. As previously pointed out, two LPG tanks, each with a capacity of 12,400 Litres, shall feed both the boiler and the RTO. The tanks shall be situated above ground, surrounded by a retaining wall and covered with gravel.
15. The RTO's main characteristics are the following:
 - Flow rate (extraction): 95,000m³ per hour
 - Configuration: 5-chamber system
 - Working temperature: 900°C
 - Residence time: Minimum of 1 second at the minimum operating temperature in the oxidation chamber
 - Fuel for burners: LPG
 - Thermal recovery efficiency: >96.5%
 - Abatement efficiency: >95%
 - Stack Height: 33 metres.
16. The height of the RTO stack shall be the same height of the incinerator's stack, thus limiting visual impact.
17. The PPIS, via the air handling units, collects air and directs it to washable filters. The filters are washed using main waters and the water is directed to the wastewater treatment plant. After that, air is directed through ionisation tubes. At this stage, the hydrogen and oxygen molecules are electrically charged. Next, the ionised air is distributed via a duct network and inserted in workspaces from high level via droppers with diffusers. In the network, droppers are placed at approximately 3m interval. The ioniser air neutralises odorous gases. As can be noted in the literature submitted (see Annex 06), from the manufacturer's experience, the PPIS can reduce odour loads by greater than 80% within 1.5m of the odour source and greater than 90% within 3m.
18. The PPIS has been chosen over other technologies as the best available technique in terms of both effectiveness and efficiency. In fact, this system requires minimal electrical demand, no chemicals or water, and is simple to maintain.
19. The Dual Fuel Burner System is made up of the following elements:
 - Oil pumping unit
 - Filtration unit
 - Electrical heater
 - Automation cabinet

- Safety and control equipment
 - Oil gun (lance).
20. Tallow is pumped, via heated pipes, from the silos on the TTF lower area to a buffer tank situated in the incinerator plant room on the upper level. From the buffer tank, tallow is diverted to the 'skid' which in essence controls the feeding of fuel to the lance. The 'skid' is equipped with superheaters, pumps and filtration and it is this instrumentation which controls the atomisation of fuel off the lance. From the 'skid', the user can choose between injecting tallow or heating fuel oil.
 21. Maximum tallow use / ignition shall be 1,500 kg per day. The design tallow flowrate is 470 kg/h.
 22. The air emanating from the heating unit of the Dual Fuel Burner shall be directed by means of ducting to the RTO where it shall be treated.
 23. Refer to Annex 06 for specifications and/or drawings of the LPG Tanks, Boiler, Odour Abatement Equipment (RTO and PPIS), Marshalling Area Shed and Dual Fuel Burner.
 24. The following table provides responses to various requests for information included within the IPPC Permit Application (Form C).

Section	Relevant Information
C2.1 Environmental Management System Provide details of any changes to environmental management techniques resulting from your proposals.	<p>The QEMS is being updated to incorporate the use and monitoring of Boiler, PPIS, RTO, and Dual Fuel Burner. Following commissioning by contractor, procedures shall be drafted by end of September of 2023 to capture checks and acceptable parameter ranges, aimed at ensuring safe operation of the new equipment.</p> <p>Furthermore, storage procedure shall be updated to include Marshalling Shed.</p>
C2.2.2 Proposed Activities Describe the proposed techniques and measures to prevent and reduce waste and emissions of substances and heat (including during periods of start-up or shut-down, momentary stoppage, leak or malfunction) as a result of your proposals.	<p>Air from the Autoclave process, particularly the rendering and the pressing, shall be directed and treated in the RTO. Same applies to air in proximity of the heating unit, the latter used to heat the tallow prior to it being pumped and directed to the dual burner.</p> <p>Odorous air from the Incinerator's Marshalling Shed and Shredder Room, and also the Autoclave's Shed shall be neutralised via the PPIS.</p> <p>Specific to heat losses, the combustion unit of the RTO is equipped with thermal insulation with ceramic fibre (200-250mm).</p> <p>The Dual Fuel Burner's transfer piping and buffer tank are insulated in order to prevent and/or limit heat loss.</p>
C2.2.3 Proposed Activities Submit a flow diagram summarising the proposed installation activities and indicating the changes.	<p>Process Flows Diagrams are detailed in Annex 07.</p>

<p>C2.2.5 Proposed Activities Include an outline of the main alternatives considered to the proposed technology, techniques and measures.</p>	<p>Given past odour complaints, WasteServ opted to address the issue radically and decided to invest in an RTO and a PPIS. The RTO, or rather its mode, is preferred when dealing with heavy odours. At the initial stages, WasteServ considered chemical scrubbers instead of the PPIS, but the latter was deemed capable of reaching the required objective. Also, the PPIS does not generate any by-products like chemicals and/or wastewater.</p> <p>The Dual Fuel Burner System was the natural selection for the process required. Other dual burners on the market use the same concept.</p>
<p>C2.3 Raw Materials Identify any changes to the raw and auxiliary materials, and any other substances (including fuels) proposed to be used as a result of your proposals.</p>	<p>The RTO is powered by LPG and electricity, while the PPIS is powered by electricity. The Dual Fuel Burner shall use tallow as fuel, thus reducing the use of conventional fuel.</p>
<p>C2.6 Energy C2.6.1: Describe any changes to the annual energy consumption, highlighting the main energy consuming equipment, and generation by source and end-use (including information on energy generated on site, if applicable).</p>	<p>Additional energy consumption is expected to be:</p> <p>RTO ≈ 337kW + 110 kg/hour of LPG. PPIS ≈ 1,018.5kW. Dual Fuel Burner ≈ 20kW. Boiler ≈ 3917 kW x 4380 hours.</p>
<p>C2.6.2: Describe any changes to the proposed basic measures for improvement of energy efficiency.</p>	<p>No changes in energy efficiency are captured in this variation.</p>

<p>C2.7 Water Provide a breakdown of any changes to the proposed annual water consumption by source and end-use.</p>	<p>No change / increase in water consumption is envisaged.</p>
<p>C2.8 Risk Assessment Describe any changes to the documented system used to identify, assess and minimise the environmental risks and hazards of accidents and their consequences.</p> <p>Include any changes to emergency plans in case of fire, actions to be taken in case of failure of abatement equipment and other environmentally relevant incidents (e.g. spillages, gas leakage).</p>	<p>Annex 10 includes an Emergency Response Plan applicable to the facility.</p>
<p>C2.9 Training Please indicate whether any changes to the staff training programme will be required. Please submit the name of the technically competent person on site who will be responsible for such training.</p>	<p>Training has been carried out by the contractors on 21.12.2022 and on 30.01.2023 for AHUs and RTO respectively. The training has been documented via training logs. The Management Systems Unit within WasteServ shall map the operation of the equipment, routines and/or processes into procedures.</p>

<p>C2.10 Cessation Describe any changes to the outline decommissioning plan describing the draft proposed measures upon definitive cessation of activities, to avoid any pollution risk and return the site of the installation to a satisfactory state (including relevant measures for the design and construction of the installation).</p> <p>This plan shall include a draft waste management strategy, and a qualitative assessment of the potential for contamination of land and groundwater pollution which might arise from the historical and current processes carried out at the installation.</p>	<p>The introduction of the Marshalling Shed and the Dual Fuel Burner does not introduce any significant features that would impact the outline decommissioning plan. On eventual decommissioning, the infrastructure introduced would largely result in the generation of: scrap metal, insulation, some WEEE components and residue from cleaning. All waste types can be diverted to authorised facilities locally (WasteServ's facilities included) or abroad.</p> <p>The Outline decommissioning plan has been revised. Refer to Annex 12 for details.</p>
<p>C3.1.1 Waste Characterise (using the European Waste Catalogue code, in accordance with LN 184 of 2011 as amended) and quantify any changes to each waste stream from the installation.</p>	<p>No waste (output) shall be generated as a result of the use of the odour abatement equipment and the dual fuel burner. Bottom Ash, Fly Ash and Boiler Ash will continue to be generated but these waste streams are the result of the incineration itself, not the burner type.</p> <p>Following years of operations, WasteServ streamlined the type of waste accepted at the site. To this end, the crossed off waste types (marked in blue) in Annex 11 are to be removed, while WasteServ wishes to include EWC Codes 20 01 01 and 20 01 30 (marked in green).</p>

<p>C3.1.2 Waste Describe any changes to the proposed measures for waste management, storage and handling. If any are identified, also indicate the storage location of wastes on a site layout plan and give details on:</p> <ul style="list-style-type: none"> • Maximum storage capacity; • Containment measures (including bunding capacity, where applicable); • Protective measures (including security). 	<p>Following the rendering process, tallow is stored in silos. The silos are equipped with a bund. Transfer of tallow from silos to the Dual Fuel Burner (and into the kiln) shall take place via an enclosed system, thus eliminating manual handling (consequently reducing possibility of spill). SCADA shall be used to control the process and shall alert user if action is needed. The system shall only be operated by trained personnel.</p> <p>Reference to the Marshalling Shed, the storage capacity is approximately 75 bins.</p>
<p>C3.5 Rainwater Describe any changes to how rainwater is handled on site. If any changes are proposed, attach a site drainage map indicating rainwater capture and harvesting/discharge.</p>	<p>Rainwater shall be collected and stored.</p>

<p>C3.6 Emissions to Air Identify if there may be any changes in emissions of substances to air.</p> <p>If any are identified, submit details of each emission point, the nature and the proposed quantities of substances emitted from each point and treatment/abatement measures. A block plan of the site showing each emission point should be submitted.</p> <p>For each new boiler/generator, submit the following details: rated thermal input, energy output, date of manufacture, stack height, fuel type and annual fuel consumption.</p>	<p>Given the high performance of the RTO, emissions to air are considered negligible and only the products of combustion will be present. The Boiler uses LPG, which is considered a clean fuel source, but the products of combustion will be present in the exhaust.</p> <p>There shall be no air emissions for the dual fuel burner system. Heating of tallow shall be done via electric heaters, thus there is no combustion and consequently no air emissions.</p>
<p>C3.7 Odour emissions Identify if there may be changes in emissions of odour.</p> <p>If any are identified, submit details of the main sources of odour, and the proposed techniques and measures for control of odour.</p>	<p>The PPIS and the RTO shall drastically reduce odours from the facility.</p> <p>As stated earlier, the efficiency of the RTO is >95%. Odour is expected to be negligible. Reference to the PPIS, from the manufacturer's experience, the system can reduce odour loads by greater than 80% within 1.5m of the odour source and greater than 90% within 3m.</p> <p>Reference to the Dual Fuel Burner System, air in proximity of the heating unit shall be directed to the RTO for treatment. The transfer of tallow from the silos to the kiln shall also take place in an enclosed system, thus this aspect does not contribute to odour.</p>
<p>C3.9 Noise C3.9.1: The main sources of noise and vibration (including infrequent sources) of the new proposal; C3.9.2: The proposed techniques and measures for control of noise;</p>	<p>It is plausible that RTO and the PPIS will increase the noise profile of the site.</p> <p>That said, key areas of the RTO shall be insulated by means of mineral wool and sheet aluminium to finish. The value of Sound Pressure Level (SPL) of the RTO shall be 85 dBA at 1.5m of distance. Downstream, that is further away from the plant, this figure will go down and decrease.</p>

<p>C3.9.3: The nearest noise sensitive locations and distance away from the site (a site map may be submitted for this purpose); and</p> <p>C3.9.4: Relevant environmental noise measurement surveys which have been undertaken (monitoring shall be according to the latest revisions of ISO1996 and the rating of industrial noise affecting residential areas shall be according to BS 4142; monitoring shall be carried out exclusively using type 1 sound level meter).</p>	<p>Reference to the PPIS, for the largest of the two of the Air Handling Units (Model 10.5), the average SPL value is 65 dBA at 1m of distance. The full spectrum of noise levels at different frequencies is provided in the units' drawings themselves. Refer to Annex 06 for details.</p> <p>With regards to the dual fuel burner, the possible source for noise and vibration are the pumps needed to transfer the tallow from the silos to the kiln. Given that the tallow shall however be heated, its viscosity shall decrease, thus pumps used shall be of a regular size with limited potential for noise.</p> <p>Once all equipment has been installed, a noise survey shall be commissioned. <i>Update: At time of consolidation (10.07.2023), the survey results were received, and they are attached in Annex 15. In general terms outside the site boundary, it is not believed that noise levels associated with the TTF in operation increase ambient noise levels by more than 5dB.</i></p>
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<p>C3.10 Monitoring Describe the proposed measures for monitoring emissions arising from the proposal, including any environmental monitoring. The following must be specified:</p> <p>C3.10.1: The location of each proposed monitoring point (plotted on a suitably-labelled block plan of the site);</p> <p>C3.10.2: The substances (in each environmental medium) which are proposed to be monitored;</p> <p>C3.10.3: The frequency with which monitoring is proposed to take place;</p> <p>C3.10.4: The proposed measurement methodology, which should be a standard methodology, such as EN or ISO standard, or equivalent;</p> <p>C3.10.5: The proposed procedure for evaluation of the results.</p>	<p>Air Emissions</p> <ul style="list-style-type: none"> - As previously pointed out, given the mode of operation and the technology utilised, it is expected that the RTO and PPIS do not contribute to air emissions. - When the new boiler is in use, one would expect that the ‘products of combustion’ are present in the exhaust. That said, the fuel burnt in the boiler shall be LPG, which is considered a clean fuel source. Emissions (if any) are expected to be minimal. - Reference to the Dual Fuel Burner, the equipment itself is not expected to generate emissions. As a side note, the utilisation of tallow as fuel may in fact contribute to less emission, for the reason that tallow contains lower sulphur content than regular heating fuel oil. Therefore, less SO_x gases can be expected. That said, air emissions from the incinerator’s stack shall continue to be monitored (continuous and periodically) as per current regime. <p>Odour</p> <ul style="list-style-type: none"> - The PPIS and the RTO shall drastically reduce odours from the facility. - Reference to the Dual Fuel Burner system, air in proximity of the heating unit shall be directed to the RTO for treatment. The transfer of tallow from the silos to the kiln shall also take place in an enclosed system, thus this aspect does not contribute to odour. - The methodology for the ‘Odour Monitoring Baseline Survey’ has been submitted and approved by the Authority. The next step is to undertake the monitoring as per approved method statement. WasteServ is currently seeking laboratories which are capable of executing the approved monitoring regime. <p>Wastewater</p> <ul style="list-style-type: none"> - No changes; current monitoring regime shall remain in place. <p>Noise</p> <ul style="list-style-type: none"> - To have a better understanding of how the newly installed equipment shall affect the noise profile of the site, a noise survey shall be carried out after all equipment is in place. <i>Update: At time of consolidation (10.07.2023), the survey results were received. Refer to Annex 15.</i>
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<p>C4.1 Environmental effects Provide an assessment of the potential significant environmental effects (including transboundary effects) of the foreseeable emissions from the proposal.</p>	<p>When it comes to air emissions, as stated earlier, when the new boiler is in use, one would expect that the ‘products of combustion’ are present in the exhaust. That said, the fuel burnt in the boiler shall be LPG, which is considered a clean fuel source. Any transboundary effects shall be minimal.</p> <p>Reference to the dual fuel burner and the use of tallow as fuel, the said tallow contains half of the sulphur content found in heating gas oil. Therefore, its use as alternative fuel means less potential for emissions. This is apart from the indirect benefit of reducing the amount of convention fuel used.</p> <p>The objective of the RTO and PPIS is to radically reduce odours. The RTO is the preferred technology for high efficiency abatement. On the ground, WasteServ shall conduct odour monitoring as per methodology agreed with ERA to ascertain that transboundary effects (if any) are minimal or negligible.</p> <p>Modern equipment is typically equipped with insulation to damp noise levels as much as possible. Furthermore, sound amplitudes diminish with distance. While noise profile of the site may increase, it is expected that such increase will not impact sensitive receptors negatively. As stated in the response to C3.10, a noise survey shall be commissioned once all equipment is in place.</p>
<p>C4.2 Effects on other sites Provide an assessment of whether the proposal is likely to have a significant effect on another site in Malta and, if it is, provide an assessment of the implications of the installation for that site.</p>	<p>No effects on other sites foreseen.</p>
<p>C6.2 Other Sites Are there any other sites which may be affected by emissions from the proposal? (Refer also to your answer to C4.2).</p>	<p>No effects on other sites foreseen. In the immediate environ there are some commercial businesses and public abattoir.</p>

<p>C9.1 Expenditure plan Please provide a plan of the estimated expenditure for each phase of the following specified activities arising from your proposal.</p> <p>The plan should include the likely costs of:</p> <ul style="list-style-type: none"> □ monitoring (emission / discharge and ambient monitoring); □ clearing the installation (including drainage systems) of all wastes; □ remedial action in the event of the failure of pollution control systems. 	<p>RTO and PPIS Odour survey (initial study): ≈ € 50,000 Odour monitoring: Will be provided at a later stage Clearing the installation: N/A Remedial action: N/A</p> <p>Marshalling Shed Odour monitoring: Captured via the above. Clearing of the shed: Shed can be cleared of bins using WasteServ's employees (captured via pay) Remedial action: N/A</p> <p>Dual Fuel Burner Emissions monitoring: ≈ € 75,000 per annum (already captured through present regime) Clearing of instrumentation: ≈ € 2,000 Remedial action: N/A</p> <p>Boiler Annual emissions monitoring ≈ € 800</p> <p>Others Noise Survey: ≈ € 8,000</p>
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Annex 01: IPPC Application Forms

Annex 02: Company Registration Certificate

Annex 03: Existing Permits

Annex 04: Improvement Programme Update

Annex 05: Site Plans

Annex 06: Specifications & Drawings

Annex 07: Process Flow Diagrams

Annex 08: Maintenance Plan

Annex 09: BAT Comparison

Annex 10: ERP

Annex 11: Permitted EWC Codes

Annex 12: Decommissioning Instructions

Annex 13: Fuel Savings

Annex 14: Medium Combustion Plant

**Annex 15: Study on the Noise Emissions from
Marsa Thermal Treatment Facility**