

## **Sant' Antnin Waste Treatment Plant: Decommissioning method statement – Phase 1 (AD plant and ancillary equipment)**

**IPPC permit IP 0005/13/B**

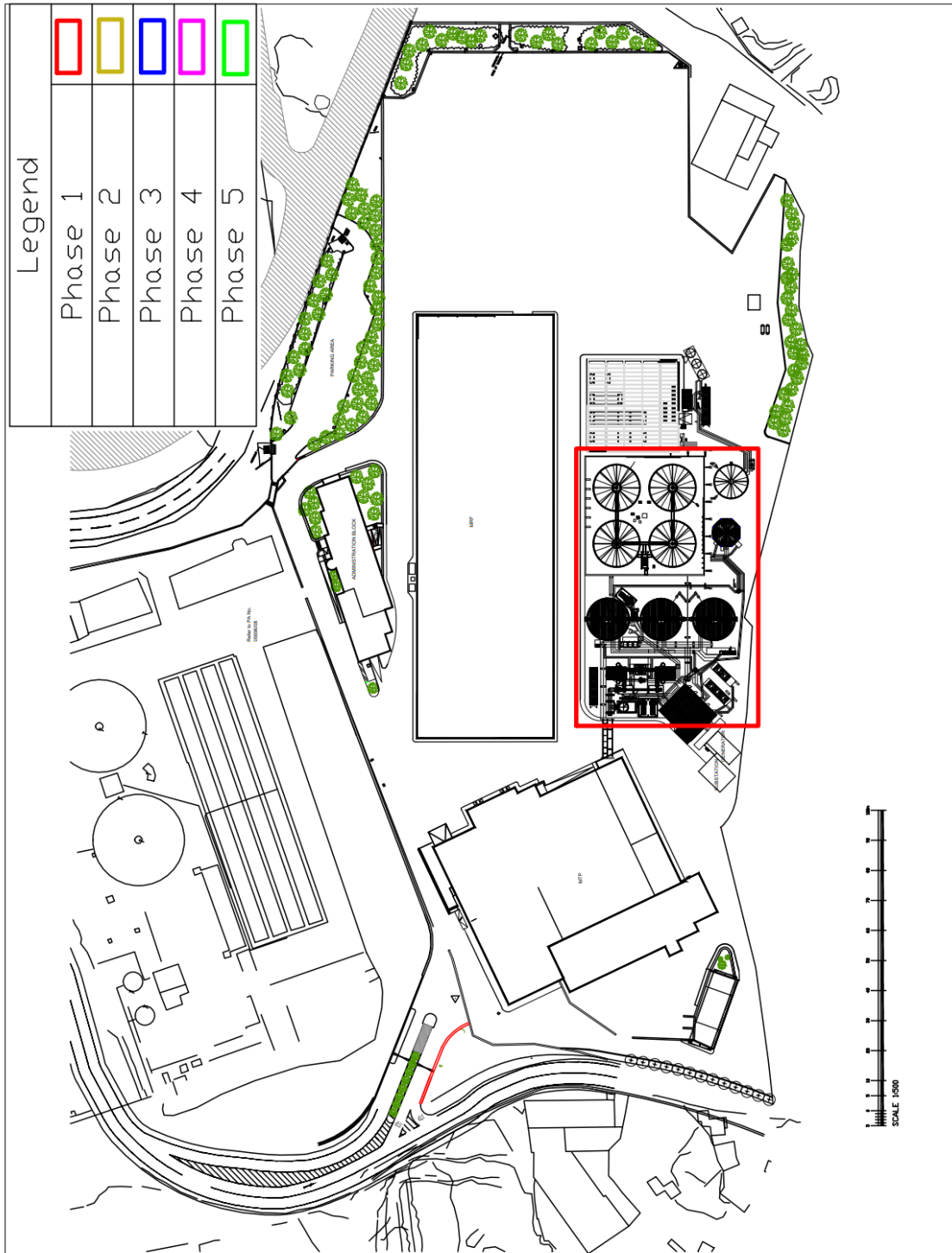


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# 1. Introduction

1. The Sant' Antnin Waste Treatment Plant consists of a waste management facility originally designed for the management of pre-treated and unsorted municipal wastes, through the following operations:
  - Material Recovery Facility intended to recover materials for recycling from the collection of sorted wastes from households;
  - Mechanical Treatment Plant (MTP) intended to recover materials for recycling from municipal wastes, and organic wastes from Municipal Solid Waste, since replaced by an Organic Processing Plant (OPP) for the treatment of organic wastes; and
  - Anaerobic Digester (AD) for the digestion of organic wastes to produce gas suitable for the generation of electricity for a Combined Heat and Power Plant (CHP).
2. Wasteserv Malta Ltd. is in the process of preparing for the decommissioning of the Sant Antnin facility, with intention of eventually surrendering the IPPC permit, and returning the site to a state fit for eventual reuse. In this regard, Wasteserv has commissioned a series of method statements for the phased decommissioning of the various areas within the site.
3. The plant selected for decommissioning in **Phase 1** are the AD plant and ancillary equipment, as well as other equipment in the area that is now redundant. The general extent of phase one is indicated in the plan attached overleaf. This document reviews the plant that is to be removed, considers the environmental risks involved, and provides a method statement for the decommissioning of the plant and the disposal of the resultant constituent wastes.



## 2. Mechanical Treatment Plant

4. A review of the activities carried out in the area identified as Phase 1 highlighted the presence of the following components:
  - CHPs
  - Stack
  - Chiller
  - Boiler
  - Hydrolyser & Digestion Tanks
  - dewatering-press or rotary screen
  - Pipe work & racks
  - RTO
  - Scrubber
  - Flare
  - Gas Bubble
5. The sub-station and emergency genset will be retained on site, and integrated into future uses on site for provision of power.
6. The following components are intended for reuse in other Wasteserv facilities, and are not to be considered as waste:
  - specific items such as air blowers, motors, pumps and compressors;
  - Doors and roller shutter of the ex-MTP hall;
  - basic health and safety equipment (e.g. hoses, reels and extinguishers);
  - OPP screw conveyors; and
  - valves and fittings from across the plant (e.g. manual valves, pumps) that are considered as being fit for reuse.
7. Table 1 overleaf lists the component materials that are expected to be generated from each piece of equipment. This list of component materials has been generated through direct observation through a site visit, and review of available documentation (manuals, drawings, etc.). The above does not include concrete foundations or plinths.

**Table 1:** list of equipment and constituent components

<b>Equipment</b>	<b>Summary of components</b>
CHPs	<ul style="list-style-type: none"> <li>• Metal casings &amp; moving components</li> <li>• lube oils</li> <li>• coolant</li> <li>• lead acid batteries</li> <li>• greased components</li> <li>• Control panel, motors, switches &amp; cabling</li> <li>• Limited plastic/rubber components (vibration mountings, hoses, gaskets etc.)</li> </ul>
Pumps and gearboxes from different systems	<ul style="list-style-type: none"> <li>• lube oils</li> <li>• other lubrication systems requiring specific investigation (e.g. Nord gearboxes)</li> <li>• metal casings (ferrous and non-ferrous fittings)</li> <li>• connections to electronic controls</li> </ul>
Stack	<ul style="list-style-type: none"> <li>• Metal structure</li> <li>• switches &amp; cabling</li> </ul>
Chiller	<ul style="list-style-type: none"> <li>• Metal casing</li> <li>• Control panel, switches &amp; cabling</li> <li>• refrigerant (R410a)</li> <li>• lubricant oil, glycol water mixtures</li> <li>• Filters</li> <li>• Limited plastic/rubber components (vibration mountings, hoses, gaskets etc.)</li> </ul>
Boiler	<ul style="list-style-type: none"> <li>• Metal frame &amp; moving components</li> <li>• lube oils</li> <li>• greased components</li> <li>• Control panel, motors, switches &amp; cabling</li> <li>• Limited plastic/rubber components (vibration mountings, hoses, gaskets etc.)</li> </ul>
Hydrolyser & Digestion Tanks	<ul style="list-style-type: none"> <li>• Metal frame &amp; moving components: steel sheet panelling, aluminium cladding, and stainless-steel agitation mixer</li> <li>• rockwool insulation</li> <li>• greased components</li> <li>• switches &amp; cabling</li> <li>• Limited plastic/rubber components (vibration mountings, hoses, gaskets etc.)</li> </ul>
screw-conveyor, dewatering-press and rotary screen	<ul style="list-style-type: none"> <li>• Metal frame &amp; moving components</li> <li>• greased components</li> <li>• Control panel, switches &amp; cabling</li> <li>• Limited plastic/rubber components (vibration mountings, hoses, gaskets etc.)</li> </ul>
Gas analyser	<ul style="list-style-type: none"> <li>• Metal housing</li> <li>• Control panel, sensors, switches &amp; cabling</li> <li>• microprocessor circuits, LCD screens</li> <li>• air filters/filter cartridges</li> </ul>
Pipe work & racks	<ul style="list-style-type: none"> <li>• metal frame (iron)</li> <li>• plastic fittings and hoses</li> </ul>

Equipment	Summary of components
RTO	<ul style="list-style-type: none"> <li>• aluminium housing, metal casings and structures, valves</li> <li>• Control panel, pumps and motors, switches &amp; cabling</li> <li>• lubrication oils in pumps and valves</li> <li>• molybdenum disulphide lubrication in the rack and pinion of Automax actuator</li> <li>• battery</li> <li>• Limited plastic/rubber components (pipework, vibration mountings, hoses, belt drives, gaskets etc.)</li> <li>• ceramics (Vocsi boxes)</li> <li>• glass wool &amp; fire clay</li> </ul>
Scrubber	<ul style="list-style-type: none"> <li>• Metal housing</li> <li>• fibreglass components (not highlighted as hazardous in specification)</li> <li>• Control panel, motors, sensors, switches &amp; cabling</li> <li>• manometer with liquid content (unspecified)</li> <li>• HDPE tanks (plastic)</li> <li>• sulphuric acid</li> <li>• ammonia</li> <li>• ammonium sulphate</li> <li>• Limited plastic/rubber components (pipework, couplings, vibration mountings, hoses, gaskets etc.)</li> </ul>
Flare	<ul style="list-style-type: none"> <li>• stainless steel casings, valves</li> <li>• Control panel, switches &amp; cabling</li> <li>• Limited plastic/rubber components (pipework, vibration mountings, hoses, gaskets etc.)</li> </ul>
Gas Bubble	<ul style="list-style-type: none"> <li>• fabric membranes (PVC coated polyester) plastic</li> <li>• metal casings, valves, impeller blades, etc.</li> <li>• Control panel, sensors, motors, switches &amp; cabling</li> <li>• greased components (e.g. bearings)</li> <li>• Limited plastic/rubber components (pipework, vibration mountings, hoses, gaskets etc.)</li> </ul>

8. Specific attention will be required to particular **hazardous wastes**. These are expected to include:

- **hydraulic and lubricant oils and greases**: This will involve draining of oils through bleeding points where these are available; otherwise via gravity over appropriate containment. If necessary, this would involve dismantling of hoses and metal fittings trapping oil, and wiping down bearings etc. having significant quantities of grease. These would be stored in bunded containers.
- **batteries and accumulators** e.g. fitted to the CHPs and potentially other equipment;
- **chemicals** such as waste ammonia, ammonium sulphate, sulphuric acid;
- components having **molybdenum disulphide** solid lubricant fittings
- **oil and air filters** where these are encountered in oil systems and filters from the chiller units;
- **WEEE components** including various circuit boards, LCD screens, electric motors, etc.
- **R410a refrigerant gas** and associated lubricants from the chiller unit, which required draining by a technician licensed to carry out such works under the provisions of applicable regulations<sup>1</sup>.

9. The process of dismantling is generally expected to follow this sequence:

- i. preparation of all **health and safety precautions**<sup>2</sup>, particularly those related to disconnection of all electricity supply, removal of hazardous chemicals, ensuring that gas handling systems are certified as gas and/or fuel free, and prevention of fire or explosive atmospheres;
- ii. **Deep clean of plant from any wastes** i.e. waste materials contained within tanks, piping, and surrounding litter, as per normal cleaning/maintenance processes. It is consequently expected that no municipal wastes will be encountered during the dismantling operation. The wash waters generated during the deep clean would be handled as per the regular cleaning process.
- iii. **Removal of hazardous components** and segregation in safe storage (see further below).
- iv. **systematic dismantling of structures and equipment, through:**
  - stripping of cabling and WEEE components
  - dismantling of metal components
  - segregation of plastic/rubber components as they are exposed/removed

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<sup>1</sup> Regulation (EC) No 842/2006 on certain fluorinated greenhouse gases until 31st December 2014 and Regulation (EU)

No 517/2014 on fluorinated greenhouse gases and repealing Regulation (EC) No. 842/2006 as from 1st January 2015, Commission Regulation (EC) Nos 1493/2007, 1516/2007, 1494/2007, 1497/2007, 303/2008, 304/2008, 305/2008, 306/2008, 308/2008 and L.N. 93 of 2010 on Certain Fluorinated Greenhouse Gases, Regulations 2010

<sup>2</sup> Specific health and safety risk assessments are required for these procedures.

10. Specific attention is required for the following plant:

**A. Hydrolyser and digestion tanks** - this is to proceed through:

- Deep clean of the tank systems, where regular maintenance procedures for tank cleaning should be followed. works shall progress one tank at a time during cooler weather conditions, when odour propagation is least prevalent;
- Access points into the tanks would be opened, with the tank contents emptied into open top hoppers; the latter are immediately covered with a canvas cover on being filled, and dispatched for disposal;
- Stripping away of all cabling, pumps and fittings;
- Stripping away of all insulating foams, and packaging of the rockwool insulation into jumbo bags, taking appropriate precaution not to release particulates into the air; and
- Safe disassembly of metal structural elements into the aluminium and steel components, using cranes and shearing equipment.

**B. Power plant (CHPs) (1.2MW and 0.7MW):** - this is to proceed through:

- these are to be first drained of all oils and fuels;
- draining of coolant liquids for proper categorisation<sup>3</sup> and disposal;
- removal of batteries (probably lead-acid);
- removal of air and oil filters;
- systematic disassembly of all electronic equipment (microprocessors, control systems, motors) for treatment as WEEE; and
- systematic disassembly of metal components, wiping down any greased bearings, etc. and segregation of gaskets.

**C. Chiller** - this is to proceed through:

- this is to be drained of the R410a refrigerant and lubricating oil by a licensed technician;
- draining of coolant liquids for proper categorisation<sup>4</sup> and disposal;
- removal of air and oil filters;
- systematic disassembly of all electronic equipment (microprocessors, control systems, motors) for treatment as WEEE; and
- systematic disassembly of metal components, wiping down any greased bearings, etc. and segregation of gaskets.

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<sup>3</sup> Most probably ethylene glycol dosed with industry standard anti-corrosion additives.

<sup>4</sup> Most probably ethylene glycol dosed with industry standard anti-corrosion additives.

**D. Scrubber & RTO - this is to proceed through:**

- this is to be drained of the hazardous chemicals for safe storage and disposal;
  - draining of lubricants;
  - removal of molybdenum disulphide;
  - removal of air and oil filters;
  - systematic disassembly of all electronic equipment (microprocessors, control systems, motors) for treatment as WEEE; and
  - systematic disassembly of metal components, wiping down any greased bearings, etc. and segregation of gaskets.
11. Dismantling would be undertaken either by Wasteserv staff trained in the maintenance of this equipment, or by contractors under Wasteserv supervision. The work process would involve:
- i. Review of the structures by competent staff and evaluation of all environmental, health and safety precautions
  - ii. Preparation of all equipment and contingency measures as required
  - iii. Sequential dismantling and segregation of wastes; and
  - iv. Halting of works in case of accident or unforeseen circumstance, including the identification of a waste not readily identifiable within the equipment specifications.
12. The above waste streams cannot be quantified with accuracy at this point, given that the weights of the constituent parts are not known. However, it is clear that:
- The bulk of the wastes generated will be metal; and
  - The hazardous wastes generated are expected to be the hydraulic oils and greases, and the order of magnitude of these wastes is not expected to exceed 2-3 cubic metres

13. The dismantled components will be segregated into the following waste streams:

- |       |   |   |
|-------|---|---|
| i.    | <b>Metals</b>                                   | <ul style="list-style-type: none"> <li>• EWC 17 04 05 iron and steel</li> <li>• EWC 17 04 07 mixed metals</li> </ul>  |
| ii.   | <b>Cables<sup>5</sup></b>                       | <ul style="list-style-type: none"> <li>• EWC 17 04 11 cables other than those mentioned in 17 04 10</li> </ul>  |
| iii.  | <b>WEEE<sup>1</sup></b>                         | <ul style="list-style-type: none"> <li>• EWC 16 02 13* discarded equipment containing hazardous components other than those mentioned in 16 02 09 to 16 02 12</li> </ul>  |
| iv.   | <b>WEEE<sup>1</sup></b>                         | <ul style="list-style-type: none"> <li>• EWC 16 02 14 discarded equipment other than those mentioned in 16 02 09 to 16 02 13</li> </ul>   |
| v.    | <b>Air filters, Oil filters &amp; Oily rags</b> | <ul style="list-style-type: none"> <li>• EWC 15 02 02* absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing contaminated by dangerous substances</li> </ul>         |
| vi.   | <b>Hydraulic oils and greases</b>               | <ul style="list-style-type: none"> <li>• EWC 13 02 08* other engine gear and lubricating oils</li> </ul>  |
| vii.  | <b>Molybdenum disulphide components</b>         | <ul style="list-style-type: none"> <li>• EWC 06 03 13* solid salts and solutions containing heavy metals</li> </ul>   |
| viii. | <b>Plastic and rubber</b>                       | <ul style="list-style-type: none"> <li>• EWC 17 02 03 plastic</li> <li>• For rubber<sup>6</sup>: EWC 17 09 04 mixed construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 and 17 09 03</li> </ul> |

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<sup>5</sup>Rationale regarding classification of cables and WEEE:

- the cables are typical of those used generally in various applications, and do not include oils etc. that render them hazardous.
- the WEEE components do not contain components such as accumulators and other batteries, mercury switches, cathode-ray tubes and other activated glass and PCB capacitors.

As contingency, the attached document produced by the Danish EPA and IMPEL shall be used as a practical guide in case of detection of components not clearly indicated as being present in the specifications: *Classifying Green List waste under the 'Waste Shipments Regulation' (Regulation No 1013/2006) - practical guidelines.*

<sup>6</sup> No EWC codes are given for rubber as a subset of 17 Construction and demolition wastes. The other codes referenced are hazardous codes which are not associated with the rubber mats expected to be generated as wastes.

- |       |                                       |  |
|-------|---------------------------------------|--|
| ix.   | <b>Lead acid Batteries</b>            | • EWC 16 06 01* Lead acid Batteries  |
| x.    | <b>Coolant liquid</b>                 | • requires characterisation  |
| xi.   | <b>Refrigerant R410a:</b>             | • EWC 14 06 01* chlorofluorocarbons, HCFC, HFC   |
| xiii. | <b>Ceramics</b>                       | • EWC 17 01 03 tiles and ceramics  |
| xiv.  | <b>Insulating foam &amp; rockwool</b> | • EWC 17 06 04 insulation material other than those mentioned in 17 06 01 and 17 06 03 |
| xv.   | <b>sulphuric acid ammonia</b>         | • EWC 06 01 01* sulphuric acid and sulphurous acid                                     |
|       |                                       | • EWC 06 10 02* wastes containing hazardous substances                                 |
|       | <b>ammonium sulphate</b>              | • EWC 06 10 02* wastes containing hazardous substances                                 |

14. Lack of detail in documentation, or accident may result in the need to take emergency action. In the circumstance where unforeseen or unrecognised wastes are encountered, the following contingency shall apply:

- i. Halting of works, and use of spill kits & containment booms if appropriate;
- ii. Proper identification of waste and potential hazard;
- iii. Preparation of appropriate response and containment;
- iv. Collection, segregation and packaging of waste as may be appropriate; and
- v. Notification to the Authority if appropriate.

15. All wastes would be segregated and stored in an appropriate container, prior to dispatch to a facility permitted under the provisions of the competent environmental regulations. The above wastes will be sent for recycling or disposal to facilities licensed to accept such materials, using waste carriers licensed under the provisions of S.L. 549.45 Waste Management (Activity Registration Regulations).