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**BAT Assessment**

Envar COmposting Cambridge –Version Three , March 2025

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## 1. Introduction

This Best Available Techniques (BAT) assessment was originally created for the regulation 61 review of the site and its operations in 2019. It was subsequently updated in 2022 post the improvement conditions within the permit. a further review has now been conducted as part of the permit variation application EPR/GP3930DF/V006. This is accompanied by an appropriate measures (AM) assessment, also reflective of BAT which covers the requirements of AM.

This assessment relates to all biological permitted activities at the Cambridge Recycling Facility operated by Envar under permit number EPR/GP3930DF/V005 based at:

Heathtop House

Bluntisham Road

St Ives

Cambridgeshire

PE28 3BS

This document provides an assessment of Best Available Techniques (BAT) showing how the site will comply with 2018 BAT Conclusions for Waste Treatment and the Appropriate Measures for the activities undertaken on the site, including the BREF note on energy efficiency. The assessment includes sector specific information for biowaste as the pre-treatment mirrors exactly the biowaste treatment process.

## 2. Compliance with 2018 BAT Conclusions

### 2.1 Relationship to other documents in the EMS

The composting facility is an installation under the Environmental Permitting (England and Wales) Regulations 2016, with the activity falling under Section 5.4 A(1)(b)(i) namely a mix of recovery and disposal of non-hazardous waste with a capacity exceeding 75 tonnes per day involving biological treatment.

In the pre-application advice received from the Environment Agency Envar were advised that a new activity would need to be applied for to enable the routing of bio-dried material to be prepared and used as a fuel, even though the activity remains unchanged from the existing activity.

The addition of the installation activity 1.16.2.3 – Section 5.4 (a) (iii) and (b)(ii) is therefore covered in this BAT assessment.

The Environment Agency has published appropriate measures for biological waste treatment. These are largely based on the BAT conclusions. This document, along with the Appropriate measures assessment that make up the application show how the appropriate measures and therefore BAT is applied. 2.1.5 Further detail regarding the measures in place is given in the EMS Summary, Operating Techniques, Odour Management Plan, Dust Management Plan, Fire Prevention Plan and Environmental Risk Assessment.



## BAT Assessment

Table 2.1 below shows compliance measures against relevant BAT requirements:

| **Table 2.1 Compliance with the 2018 BAT Conclusions** | |
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| **BAT Requirement** | **Compliance** |
| BAT 1 Environmental Management System | Standard operating procedures are in place for waste pre-acceptance and acceptance and all waste treatment operations at the site. ENVAR Composting Limited have an Environmental Management System in place at the site which is externally audited and maintained. |
| BAT 2 Site pre-acceptance and acceptance procedures, waste tracking, sorting of waste, wase segregation and managing the quality of outputs | Pre acceptance procedures will ensure that only compliant waste types are accepted. These pre acceptance procedures are at the time of review “Envar MS 2.31 - Waste Acceptance, Inspection, Quarantine and Rejection. V5”, “Envar MS 2.24 Non-Conformities, Corrective and Preventive Actions V3” and “Envar MS 1.7 Contract Tendering Review and Acceptance”.  Only wastes which have been subject to the pre-acceptance procedures will be accepted at the site. The wastes will then undergo waste acceptance procedures as detailed in the EMS/Operating Techniques as above. Any non-conformances are dealt with as per these procedures. Managers, operators and those with responsibility under the requirements of the procedures are trained in their practical operation. |
| BAT 3 Inventory of waste gas and wastewater streams | There are 4 emission points to air and one to water, labelled on maps as A1-A4 for air and W1 for water.  All runoff and wastewater from PAS100 compliant processes will be captured on the impermeable surfacing of the site and drained into the segregated water storage areas which are compliant with CIRIA risk assessment standards. The water is then treated (in the case of PAS Compost leachate) for reuse or discharge at the point W1 in compliance with the sites discharge permit or removed to a suitably licenced 3rd party treatment facility for recycling.  Wastewater from non-PAS composting processes shall be retained on site in segregated storage for reuse in moisture correction for the incoming non-pas, fuel producing feedstocks or for collection and removal to a suitably licenced 3rd party treatment facility for recycling. The emission is characterised within the sites EMS and has the appropriate equipment required for pollution prevention designed and built into the system this is detailed within the site procedures. Measurements required to show compliance with BAT are taken and maintained on file.  Waste gas treatment includes an in-line leachate scrubber and biofilter which has been designed to effectively treat waste gases from biological processes. Analysis is undertaken on gas streams as per the permit requirement and which has been assessed against the BAT AEL’s. The abatement system is tested as per the requirement of the sites permit. the two abatement systems are the same and cover each side of the plant.  Testing on A3 and A4 is also undertaken in line with the permit requirement. |
| BAT 4 Adequate storage at an optimised location. Separate storage for hazardous waste.  BAT 4 requires  A – optimised storage locations  B – adequate storage capacity  C – safe storage  D – separate area for handling of packaged hazardous waste | A – storage locations are optimised and set out within the site EMS for all activities this includes the treatment of biowaste for bio drying. The storage locations are optimised for this waste storage is internal and bunded with drainage and odour abatement. This protects receptors from adverse effects the storage is in such a way to minimise handling and efficiently manage the process  B – waste storage capacity is defined within the site EMS and is calculated to be in line with relevant requirements such as the FPP requirement. The quantity of waste is measured though visible storage bay capacity and weighbridge records. Within the Sop the operator reviews and monitors storage amounts and times this is also mirrored in the FPP. A compost liquor storage plan has been submitted and accepted by the EA, this infrastructure is not changing and therefore there is no change in its functionality. Liquors which cannot be reused within the IVC for biodrying shall be collected in a bunded tank in compliance with the required standard.  C – Safe storage is managed by having the appropriate equipment for the task which is specified for that operation. wastes are stored in conditions appropriate for their nature, there are no wastes which are particularly susceptible to heat or light etc. there are no wastes stored in containers or drums.  D - No hazardous waste will be received at the site. All incoming green wastes stored on an impermeable concrete pad with sealed drainage system. Procedures are in place to prevent hazardous wastes being delivered and then to train operatives in their identification and the appropriate action they should take if hazardous wastes are inadvertently found. |
| BAT 5 safe handling including management of spills and staff training | No powders to be accepted onsite.  Handling and transfer of wastes are undertaken by competent staff which are trained through Envar internal training system covered by the Integrated Management System (IMS) which is ISO 9 and 14001 accredited by a UKAS accredited certification body (Currently LRQA).  All waste handling and transfer is recorded on the weighbridge system and validated using the acceptance procedures.  Liquid waste would be limited to low-risk materials already handled on site which is predominantly composting leachate from other composting sites treating the same material as per Envar current permit and water from food production such as salad wash water, during the summer to reduce the reliance on potable supplies. No non PAS100 compliant input liquid waste would me imported to site. the site is compliant with the requirements of CIRIA 736 and is completely internally bunded.  The site SOPS detail how the operation is undertaken to ensure risks are minimised.  Staff trained regarding safe storage, appropriate wastes for treatment, proper control of machinery, quality of output and environmental risks (e.g. understanding of dust prevention plan and fire prevention plan). |
| BAT 6 and BAT 7 Monitoring emissions to water | Run off and leachate is contained within the purpose-built lagoon and sent for treatment at a licenced facility. The lagoon has been designed by a competent engineer, CIRIA assessed and is constructed against the specification required  All tanks and containers on site are constructed to relevant standards and inspected in line with those standards under the requirements of relevant standards of assessment. All permit required monitoring is carried out in line with BAT AELs.  No untreated water which is produced under the biowaste (non-PAS) process is treated or discharged it is all taken to another suitably licenced facility for treatment and recovery.  Current on site processes and the storage systems being used are in line with the required standards which has been signed off by the EA and/or submitted to the EA.  Internal (IVC) drainage shall be stored in a specifically designed bunded tank which shall comply with the requirements of CIRIA 736 and be signed off by a competent person. |
| BAT 8 Monitoring of point source emissions to air | Emissions to air are monitored under the current permit in line with the BAT AEL requirements and the environmental permit and monitoring schedule. The current biowaste treatment process is permitt3ed to and can treat the same material for a different end point (compost rather than fuel production) but the process stays very much the same.  Monitoring is carried out in line with the required timescales and parameters as given in BAT 8 |
| BAT 9 monitor emissions from regeneration of solvents, treatment of solvents and use of solvents to decontaminate equipment containing POPs. | Not applicable. No waste solvents will be accepted. No POPs or potential POPs waste will be accepted into the biowaste process |
| BAT 10 Odour monitoring where a nuisance at sensitive receptors is expected or has been substantiated. | Odour emissions are monitored as per the abatement system monitoring plan given in the permit and as per the relevant information in the odour management plan which is available and updated on site periodically in conjunction with the EA. |
| BAT 11 monitor energy, raw material and water use | Use of diesel, electricity, water and raw materials (e.g lubricants for site plant) is monitored and recorded.  This includes direct measurements, calculation and recording using live tracking and manual reads including cross checking against invoices and weight measurements from the weighbridge. This is recorded for the maintenance of the energy efficiency plans and the carbon reduction plans which the business produced annually as part of its carbon reduction strategy.  Any changes go through a justification process whereby the alteration needs to be reviewed on and against environmental performance at board level. |
| BAT 12 Odour Management Plan in place | An Odour risk assessment/ Management Plan has been prepared and submitted to compliment the current OMP and superceed it.  This contains a protocol for odour monitoring including actions and timelines and also a protocol for response as per BAT 12 |
| BAT 13 Reduce odour by limiting residence times, using chemical treatment and optimising aerobic treatment | Chemicals will not be used in the composting process as these may add to emissions and can mask rather than treat the odour.  Residence times for waste storage prior to composting are limited within the various site requirements. Waste will enter the managed composting process as soon as possible and at least within 72 hours.  Good composting practices will be in place to ensure aerobic decomposition with the main decomposition products being carbon dioxide and water, the system is monitored constantly by SCADA, Supervisory Control and Data Acquisition, is a system that uses computers, networked data communications, and graphical user interfaces to monitor and control industrial processes and machinery in real-time. Methods for management of the active composting process are detailed in the site Operating Techniques. This system is automatic with an alarm system and can be controlled anywhere in the world with a phone signal. |
| BAT 14 Minimise sources of diffuse emissions e.g. dust by minimising sources of emissions, using good quality well maintained plant, damping down where needed, cleaning waste storage areas having a leak detection and repair (LDAR) programme | Site roads and storage areas will be swept as necessary to prevent a build-up of dust. Plant will be maintained in accordance with the manufacturer’s recommendations. A water supply is available to allow damping down where necessary. Emissions of particulates will be controlled in accordance with the Dust Management Plan.  The process area is sealed with appropriate ventilation and has been running a similar process since construction  cleaning and maintenance/repair are managed by an in-house team of engineers and maintenance operatives. |
| BAT 15 and BAT 16 Flaring only for safety reasons, correct design of flare | Not applicable. No gas produced or imported/used to site. |
| BAT 17 Noise Management Plan where nuisance at sensitive receptors is expected or has been substantiated. | Not applicable to this process at current. No noise complaints have been recorded and the process infrastructure is not changing from what currently exists, the hours of operation, processing rate and all other parameters stay exactly the same. |
| BAT 18 reduce noise by one, or a combination of appropriate location, proper operation and maintenance of plant, low noise equipment, noise attenuation. | Plant will be operated by trained staff and maintained in line with the manufacturer’s recommendations. Noise levels will be a consideration in purchasing new equipment with quieter models used where cost effective. Smart reversing alarms shall be used on plant and equipment where possible. These alarms change volume in reaction to ambient noise, only increasing the outputted dB level when ambient noise is higher and therefore a louder tone is required to ensure awareness of surrounding persons.  A – location of buildings are as they currently exist and they are located so as to minimise operational noise to any third-party receptor  B – operational measures in place include the inspection and maintenance of equipment within the manufacturer’s recommendations the closing of doors when not in use and the proper training of operators, balancing of fans and noise controls on planning permission.  C – all equipment is assessed on purchased for environmental emissions and compliance to noise minimisation  D – all equipment is fitted with statutory noise reduction equipment  E – all operations take place as per the current set up for which noise controls are already in place. |
| BAT 19 Manage water effectively by managing water use, recirculating water where appropriate, reducing the chance of overflows, roofing waste storage areas, impermeable surfacing and adequate drainage. | The site is designed to capture and reuse all water where possible.  Segregated water for pas and non-pas inputs shall be maintained with complete hydraulic separation  Water shall be reused for input material moisture correction  All surfaces are impermeable in line with CIRIA 736  All tanks are in line with relevant CIRIA standards  Waste storage areas are rooved where appropriate (not applicable for open windrow as it is impossible IVC bio drying and IVC composting only)  All drainage infrastructure is designed to contain the required amount of runoff  Buffer storage is included within the site capacity as per the FPP. |
| BAT 20 treatment of wastewater | Water in the lagoon will be aerated to reduce odour but will not be specifically treated, instead it will be tankered off to a waste water treatment works if required or to another ENVAR site for use in the active composting process if it complies with the PAS composting process. Bio drying water shall be kept separate and taken for recovery at a suitably licenced site or it shall be re-used in moisture correction.  An activated sludge treatment process is applicable with chemical flocculation and coagulation for pas composting waste water. |
| BAT 21 Limit emissions from incidents by protecting plant from malevolent acts, effective controls, prevention of fire, incident management plan, logging incidents and reviewing for | A Fire Prevention Plan has been developed for the site, including management of firewater, this plan will be kept up to date and reflect changes at the site. There will be safe means to isolate plant in the event of an incident. Site security in place including fencing around the site, all incidents and near misses logged as reviewed on a regular basis for lessons learned.  Procedures are in place for containment and emissions management a log and all appropriate procedures to follow up and learn from such incidents. Included within the site procedures for non-conformance and corrective actions in line with 14001. |
| BAT 22 reduce raw material use by substituting waste | The only use of waste appliable to the composting or bio-drying is the re-use of water from the process to amend materials moisture content for microbial action. In the previous reg 61 review the EA concluded this was not relevant. |
| BAT 23 Energy balance and energy efficiency plan | Specific energy use recorded. Energy used will be measured and reviewed on a regular basis. Plant will be properly maintained to prevent excessive use of diesel. Energy efficiency plans will be produced for the site detailing carbon emissions calculation, emissions reporting and efficiency improvement measures for the Envar group as a whole  The site maintains a carbon reduction plan and energy efficiency plan in line with carbon reporting requirements and undergoes regular energy efficiency audits from a third party (currently Planet Mark) |
| BAT 24 Reuse of packaging | Not applicable. Waste is accepted and dispatched loose. |
| BAT 25 mechanical treatment of waste | Shredding of green waste will be done with the appropriate controls and under the guidance of the environmental management system. This is inside a building and is not a material type which included BAT25 relevant chemicals scrubbing of extract air is undertaken in any case. |
| BAT 26, 27 and 28 applicable to shredding of metal | Not applicable. |
| BAT 29 and 30 applicable to treatment of WEEE | Not applicable. |
| BAT 31 Emissions to Air mechanical treatment of waste | Organic compounds (odour compounds) are released from the waste being shredded. Although natural in nature as these derive from natural vegetation and similar biodegradable products, these compounds are not those which may be found in more synthetic materials. The extract air is treated through a scrubber and a biofilter. |
| BAT 32 applicable to treatment of WEEE | Not applicable. |
| BAT 33 reduce odour emissions and to improve the overall environmental performance | An odour risk assessment had been conducted for the system which is designed to treat the proposed waste, and which is currently also licenced to do so albeit for another end purpose. Pre acceptance and waste acceptance undertaken on site as per the EMS and BAT 3. |
| BAT 34 reduce channelled emissions to air of dust, organic compounds and odorous compounds, | Fugitive emissions of odour and dust controlled as per the relevant management plans. A biofilter and scrubber compo is in use which is currently monitored and in line with the BAT AELs |
| BAT 35 reduce the generation of wastewater and to reduce water usage | Water from the process is segregated from other PAS waste waters on the site.  Water is recirculated for moisture correction  Leachate minimisation is undertaken by ensuring the incoming waste is blended in line with the appropriate C:N ratio requirements. |
| BAT 36 Reduce emissions to air and to improve the overall environmental performance | Waste will be shredded to achieve the appropriate particle size prior to entering the bio drying/composting process. Temperature and moisture content will be monitored and recorded at different points in the IVC which are fixed to inform managed control parameters and airflow is maintained.  The entire system for bio drying is working in the same line as the current IVC with no changes. The current system for managing these parameters will be maintained including SCADA monitoring, training and the appropriate blending to make a mix suitable for composting to bio dry |
| BAT 37 reduce diffuse emissions to air of dust, odour and bioaerosols from open-air treatment steps | piles will not be screened during high windspeed events , screening will be undertaken with caution or stopped in the case of adverse meteorological conditions if screening is to take place outside. The material shall be sanitised and stabilised by this point. |
| BAT 38 & BAT 39 reduce emissions to air (Anaerobic Treatment MBT) | Not Applicable to IVC |
| BAT 40 Monitor waste inputs for metals, salts, odorous compounds, oxidisers and organics. | Not applicable as this is biological treatment for the purposes of stabilisation |
| BAT 41 Limit emissions of dust, organic compounds and ammonia by use of adsorption, wet scrubber, biofilter or fabric filter. | Biofilter and scrubbers are in place for the process as above, the system is not changing, is currently permitted for these materials and is in line with BAT AELs |
| BAT 42,43 and 44 applicable to re-refining of oil | Not applicable. No waste oil to be accepted. |
| BAT 45 reduce emissions of VOC to air by cryogenic condensation, thermal oxidation, adsorption or wet scrubbing. | The wet scrubbing system and biofilter are fully compliant with BAT AELS as given in section 4.5 of the BAT document and as per BAT 8. The system is currently in place and is tested in line with these AELS. The site is currently permitted to treat these materials in line with the current permit. |
| BAT 46 and 47 applicable to regeneration of spent solvent | Not applicable. |
| BAT 48 and 49 applicable to thermal treatment of spent activated carbon, contaminated soil and waste catalysts | Not applicable. |
| BAT 50 applicable to washing of contaminated soil | Not applicable. |
| BAT 51 applicable to treatment of equipment containing PCBs | Not applicable |
| BAT 52 and 53 applicable to treatment of liquid waste | Not applicable. Liquid wastes from biodrying are stored and taken to an appropriately licenced site for recovery. |