Brookhurst Wood MBT Facility

Environmental Permit Variation - EPR/HP3238GW
Assessment of Best Available Techniques

Biffa Waste Services Limited

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Quality information

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Table of Contents

1. Report Context

1.1 Introduction

AECOM has been commissioned by Biffa Waste Services Limited ("the Operator" or Biffa) to prepare an application to vary the existing environmental permit (EPR/ HP3238GW) to include an additional area of land in proximity to the current Mechanical and Biological Treatment (MBT) Facility for the storage and dispatch of MBT outputs. The site is located at Brookhurst Wood, Horsham, West Sussex.

This report has been prepared to support the permit application and summarise the assessment of best available techniques (BAT) for the new waste transfer and storage area. The report should be read in conjunction with other supporting application information.

1.2 Proposed Facility

There are no changes proposed to the existing MBT operations.

Biffa plan to extend the existing MBT Facility to include an area of land to be used as a waste storage and transfer area for loose or baled RDF produced by the MBT process to meet the requirements of the West Sussex County Council Materials Resource Management Contract (MRMC).

The area will be operated as a trailer park whereby up to 36 transport trailers (either sealed curtain-siders or enclosed containers) may be delivered to site empty and subsequently filled with either loose or baled RDF.

It is intended that alternate bays will be used for the full and empty trailers so the drivers can drop off and collect in the same trip. The RDF will be stored for a maximum 72 hours prior to export from site to EfW's in the UK or abroad.

It is also proposed to allocate a controlled area for the storage of containerised covered CLO (Compost Like Organic), this material will be a by-product of the food waste process and will be taken to land spreading within the vicinity of the site during the week. Over weekends there will be a need to store the CLO at the site.

No waste treatment or processing will take place as part of this activity and total waste storage (daily maximum) is estimated at 450 tonnes of RDF and estimated 100 tonnes of digestate.

2. Definition of Best Available Technique

The Industrial Emissions Directive (2010/75/EU) defines BAT as “the most effective and advanced stage in the development of activities and their methods of operation which indicates the practical suitability of particular techniques for providing in principle the basis for emission limit values designed to prevent and where that is not practicable, generally reduce emission and the impact on the environment as a whole”.

The Directive continues to provide further definition as follows:

a. “available techniques” are those developed on a scale which allows implementation in the relevant industrial sector, under economically and technically viable conditions, taking into consideration the cost and advantages, whether or not the techniques are used or produced inside the United Kingdom, as long as they are reasonably accessible to the Operator.

b. “best techniques” are the most effective in achieving a high general level of protection of the environment as a whole.

c. “techniques” are both the technology used and the way in which the installation is designed, built, maintained, operated and decommissioned.

BAT may be demonstrated by either:

- Compliance with the sector-level, indicative BAT performance described guidance such as Sector Guidance Notes provided by the Environment Agency or in the European Commission ‘Reference Documents on BAT’ (BREFs) or BAT conclusions; or
- By conducting an installation-specific, options appraisal of candidate techniques.

The indicative BAT provided in the European BREF/BAT Conclusion documents is based on an analysis of the costs and typical benefits for typical, or representative, plants within that sector. When assessing the applicability of the sectoral, indicative BAT standards at the installation level, departures may be justified on the grounds of the technical characteristics of the installation concerned, its geographical location and the local environment.

3. Options Appraisal – Waste Management Route

The selection of the MBT facility for the management and treatment of household waste and similar industrial and commercial waste streams was previously assessed as BAT when the original permit application was submitted and determined. No changes are proposed to this specific process as part of this variation application and the previous conclusion is deemed to remain valid.

4. BAT Assessment for New Waste Transfer and Storage Area

An assessment of the proposed new waste transfer and storage area has been completed against the:

- "Best Available Techniques (BAT) Conclusions for Waste Treatment under Directive 2010/75/EU of the European Parliament and of the Council" (Decision 2018/1147); and
- Environment Agency Guidance "Non-hazardous and Inert Waste Appropriate Measures (NHIWAM) for Permitted Facilities (July 2021).

The summary assessment against the relevant BAT requirements is presented in Appendix A.

Appendix A : BAT Assessment

<table>
<tr><th>BAT Reference</th><th>BAT Description</th><th>Response</th><th>Application Reference</th></tr>
<tr>
<td>BAT 1

NHIWAM 2.1, 2.2 and 2.5</td>
<td>In order to improve the overall environmental performance, BAT is to implement and adhere to an environmental management system (EMS) …</td>
<td>
Biffa implement an Environmental Management System (EMS) which forms part of a Biffa Group Integrated Management System (IMS) which is designed to comply with the combined requirements of ISO9001, ISO14001 and ISO45001. The system is accredited to BS EN ISO 14001 and a copy of the current certificate of registration in Appendix C of the Management Plan . The system demonstrates the commitment of the Company including senior management to protecting the environment and to achieving continuous improvement of company environmental performance.

The EMS structure incorporates a plan, do, check and act cycle which meets the requirements of Section 2 of EA Guidance/ BAT1 criteria (i) to (ix) inclusive along with criteria (xiii) for accident management. The certified EMS will be extended to incorporate the new site transfer/storage area and storage activities. Details of the EMS are provided in the Management Plan and a copy of the Biffa Group IMS Manual is included at Appendix E. This index lists the policies, group standards (GS series), management operational guidance (MOG series which support individual GD documents), work instructions and supporting documents that form part of the overall IMS..

In relation to BAT1 criteria (xii) for residue management and NHIWAM 9, the arrangements for the MBT extension are detailed in the Management Plan, Section 3 of the application. The new waste storage and transfer area will help Biffa optimise the recovery of RDF and CLO outputs from the MBT process. Where relevant, divisions may also augment the IMS with further divisional guidance notes and site specific management plans. It can be seen from the IMS index, that the EMS is an extensive and comprehensive system. Biffa's EMS is augmented by a number of local site specific documents. These implement the requirements of the Biffa Group IMS/EMS on site.

<table>
<tr><th>IMS Section</th><th>BAT Requirement Met</th></tr>
<tr><td>MOG01-01</td><td>• Commitment of the management including senior management;
• Definition of an environmental policy that includes continuous improvement of the environmental performance of the installation;
• Planning and establishing the necessary procedures, objectives and targets in conjunction with financial planning and investment;
• Implementation of procedures, covering the areas within point IV of the general BAT conclusions for BAT 1. Within these, emergency preparedness and response is further covered by GS17/MOG17. Effective process control is in particular covered in further detail in the Process Operating Manual;
• Checking performance and taking corrective action, covering the areas within point V of the general BAT conclusions for BAT1. Corrective and preventative actions are further dealt with by Biffa's compliance strategy which is further covered in GS3/MOG03. This aspect is also covered further in site specific EMS document Non-Conformance, Corrective, Preventative Action (WS008);
• Review by senior management of the EMS and its continuing suitability, adequacy and effectiveness;
• Consideration for the environmental impacts from the eventual decommissioning of the plant at the stage of designing a new plant, and throughout its operating life. This is achieved via the Procurement Department who are tasked under MOG01-01 with ensuring that procurement considers the life cycle and environmental impact of the business.
• Following the development of cleaner technologies. This is also achieved via the Procurement Department policies.
• Sectoral benchmarking. This is accomplished in line with MOG01-01 requirements for environmental and carbon management (See also the Environment and Carbon Management Policy at Appendix C of the Management Plan).
• In compliance with this, Biffa undertakes an annual data capture exercise for the purposes of reporting scope 1 & 2 Green House Gas emissions, compliance with Pollution Inventory Returns, and Energy Savings Opportunity Scheme (ESOS). The methodology for collating the environmental metrics has been externally audited and classed as 'excellent'.
• Further, during the last year, Biffa has made the transition from CRC to ESOS. Phase 2 ESOS audits have highlighted areas in the business where Biffa are able to implement projects with short term payback viability. The existing data capture under the Green House Gas reporting mechanism places Biffa well to deliver upon the requirements of SECR from 2020 onward.
• Environmental data is also captured for a number of voluntary accreditation and reporting schemes which benchmark our performance year on year, and in comparison to our industry peers. These include Carbon Saver Gold. Carbon Saver Gold is a certification scheme for businesses who can demonstrate reductions in carbon emissions intensity. Biffa achieved 12 consecutive years of reduction in carbon emissions in 2019 and are the first company in the UK to remain certified for this length of time.
• Biffa are an active member of the Logistics Emissions Reduction Scheme run by the Freight Transport Association (FTA) and report on Biffa's logistics emissions to the association annually to demonstrate improvements in the amount of fuel consumed per mile travelled.</td></tr>
<tr><td>MOG03</td><td>• also requires the review of energy consumption trends, action plans and ESOS compliance, as above.</td></tr>
<tr><td>MOG03-01</td><td>• Waste stream management. This includes duty of care requirements and also incorporates additional detail in relation to specific waste types. Further detail on waste stream management is also included in relation to the response to BAT2;</td></tr>
<tr><td>MOG17</td><td>• Accident management plan. This covers the assessment and planning for all foreseeable emergencies and incidents. This is covered further in site specific document WS073 Emergency Response Plan.</td></tr>
</table>

With regards to specific criteria identified in BAT2, BAT3, BAT12 and BAT17 these are addressed in the relevant sections below.

In respect of staff competence, the facility will be operated by competent personnel trained to defined standards including but not limited to:

• The facility will be managed by a competent manager who holds a relevant certificate of technical competence (CoTC);
• Personnel undertaking the appraisal of a waste in respect of its suitability for acceptance/treatment in the MBT will have a minimum of a Higher National Certificate (HNC) in chemistry or an equivalent qualification;
• Personnel involved with sampling, checking or testing a hazardous waste during acceptance will be supervised by someone with a minimum of a HNC in chemistry or equivalent.
</td>
<td>Part 3, Management and Technical Plan Section 2</td>
</tr>
</table>

BAT Reference	BAT Description	Response	Application Reference
BAT 2 NHIWAM 31, 3.2, 3.3 & 3.4	In order to improve the overall environmental performance of the plant, BAT is to use all of the techniques given below: a. Waste characterisation and pre-acceptance procedures; b. Waste acceptance procedures; c. Waste tracking system and inventory; d. Output quality management system; e. Waste segregation; f. Ensuring waste compatibility; g. Sort solid incoming waste.	Waste being transferred into the new waste transfer and storage area comprises the outputs from the adjacent MBT facility only and no external sources of waste will be accepted. Waste acceptance of external waste is a function of the MBT operation and is controlled through the MBT waste acceptance procedures. In relation to each of the BAT points: a. The site has waste characterization and pre-acceptance procedures which meet the requirements of NHIWAM section 3.1 and BAT2 as detailed in the Management and Technical Plan. The waste is defined as domestic and non-hazardous as is set out in the terms of a contract with West Sussex County Council (WSCC) for the MBT site and, as such, does not vary greatly. The site only accepts waste from WSCC sources, having been constructed as part of a municipal contract for WSCC, who will retain ownership of the site at the end of the contract term. WSCC perform a waste composition analysis every few years to ascertain whether there have been any significant changes. The site has a formally agreed set of Incoming Waste Acceptance Parameters (IWAP) which are formally set out in the contract at Section 2.0. Although the site can also accept third party wastes, they must be the same as under the IWAP, although to date no third party wastes have ever been accepted. Details of waste type accepted, as well as the waste category code are provided by the previous waste holders in the form of Waste Transfer Notes. Procedure WS002, put together to support the EMS for the facility, deals with waste pre-acceptance at sections 1 and 2. See also section 3.4.1 of the Site Management Plan. b. The site has waste acceptance procedures which meet the requirements of NHIWAM section 3.2 where those measures are relevant and suitable, and BAT2 as detailed in the Management and Technical Plan. Procedure WS002 deals with waste acceptance. Incoming waste is visually assessed by Crane Operators and MSOs to ensure that characteristic parameters are met. Weighbridge Operators ensure that documentation correct and that the listed material conforms to acceptable waste types. The waste arises from domestic sources and do not comprise hazardous wastes and due to its nature is not subject to analysis beyond the characterization described above in the IWAP. Waste should all be non-hazardous. However, should non-conforming waste come on to site, this will be rejected, form WS171 (Load non-conformance report) completed and the load directed off-site. Wq1`1 c. Biffa utilizes a computerised information management system to track incoming waste which meets the requirements of NHIWAM section 3.4. All inputs into the site are recorded and tracked. The systems put into place comply with Duty of Care requirements and Permit requirements for recording and reporting waste inputs and outputs, as well as APHA requirements under ABPR. In addition to the site weighbridge systems (Site Management Plan section 3.5), the in-vessel waste treatment processes are computer controlled (Site Management Plan sections 3.8). The weighbridge ticket number is a unique load reference number, and the ticket gives details of vehicle, waste type, incoming & outgoing vehicle weights. The SCADA system controls the processing of wastes and contains volumes of digestate/organics in the various stages of the process, water volumes through the MBR process, and volumes of gas generated and stored. Full details are given in the Process Operating Manual (Appendix 3). It should be noted that hazardous wastes are not accepted and treated, and that suitable loads are aggregated into batches for treatment. The systems used record all relevant detail, including details of processing. A daily landfill diversion report, gives details of waste tonnage processed, along with output types and tonnages. d. Biffa operates a quality management system (QMS) for outputs in accordance with relevant Quality Protocols, contract specifications and other standard requirements. The QMS is certified to BS EN ISO 9001 standard. An output quality management system is fully in place. Refer to the Site Management Plan, section 3.6. The facility also meets compliance with ABPR treatment requirements. The in-vessel stage of treatment is computer controlled via the SCADA system , with time and temperature requirements being regulated by the system to ensure these are fully met before a batch is released from the relevant processing stage. Outputs measured are recorded via the system and auditable. Final outputs from the AD process are also sampled in accordance with the HACCP plan, for various tests to comply with ABPR requirements. In order to ensure compliance of outputs of digestate from the AD process, key critical control points are monitored in accordance with an approval under ABPR in accordance with an agreed HACCP plan and noted procedures HACCP1 to HACCP 4 . These comprise controls on time and temperature requirements within the process (which are achieved through the SCADA system) and also sampling and analysis of outputs at an external laboratory on a monthly basis.	

BAT Reference	BAT Description	Response	Application Reference
		Outputs of RDF are required to comply with a specification agreed with WSCC in document ANC 13 (Appendix 26). RDF is sampled daily and sent to an external laboratory for analysis to determine composition in accordance with ANC13. Water outputs from the treatment process and ancillary activities are also monitored. These comprise the surface water lagoon which is tested daily at the on-site laboratory for determinands that are specified by the Environment Agency in the surface water discharge consent (reference EPR/BB3399EE); and effluent discharged to sewer which is tested daily at the on-site laboratory for determinands that are specified by Southern Water in the trade effluent consent (reference 14695, and as amended 2018). Further samples are taken of both surface water and trade effluent for analysis at an accredited external laboratory. Outputs to air are also monitored. These comprise air discharged after passing through the odour abatement system. This air is emitted via a discharge stack and is tested daily test by laboratory staff for VOCs. The readings are logged on the laboratory internal results spreadsheet. Engine and flare emissions are tested once a year by an external contractor against the parameters set out in the Environmental Permit (EPR/HP3238GW/). e. Following visual assessment on arrival at the MBT facility, waste for treatment is taken directly to the MBT waste reception area, or in some cases directly to quarantine – this will be confirmed through the site waste acceptance procedure described in section 3.4 of the Management and Technical Plan which includes visual inspection on arrival, waste sampling and subsequent testing. . All incoming waste is mixed as it is from a fixed source and type. All waste is therefore subject to a sorting/segregation process following receipt. A number of different sorting processes are employed. Once the waste is sorted, it is then moved to segregated areas within the facility, prior to some fractions going for further treatment to process digestate via the AD process, or RDF, and recyclables segregated will also be forwarded on for further treatment and reuse. f. There are no pre-treatment activities associated with the MBT or the new waste transfer and storage area. Incoming waste will be processed through the mechanical treatment stage with residual organics passing to the AD plant, with food waste passing directly to the AD plant. g. In relation to waste storage, and waste handling, operations are detailed in the Management Plan. This will include visual inspection of the material and removal of unwanted material h. wastes with potentially incompatible characteristics – this will be confirmed using the information collected during pre-acceptance and acceptance checks.	
BAT 3 MHIWAM 2.1	In order to facilitate the reduction of emissions to water and air, BAT is to establish and to maintain an inventory of wastewater and waste gas streams, as part of the environmental management system	• Point source releases to air and water are associated with the existing MBT facility and were previously assessed as BAT. These emissions are described in section 4 of the Management and Technical Plan. No changes to these release points are proposed in this variation. • There are no new point source releases to air or water associated with the new waste transfer and storage area. Surface water runoff from the RDF storage area will be directed to the existing surface water system unless testing indicates it is unsuitable. In this event, water will be transferred via tanker or similar for processing at the MBT. Surface runoff from the CLO storage area will be collected in a dedicated drainage system and sent to the MBT for processing. • The other emissions are associated with potential fugitive releases from the waste storage and transfer area; but these are mitigated by a range of techniques as described in the various management plans. All emissions from the new waste transfer and storage area are characterised in the Impact Assessment Report and details of the controls and mitigation measures are provided in the risk assessment. The Scada control system maintains a record of operations, which deals with process flows and therefore also encompasses the Inventory of waste water and waste gas streams.	Part 3, Management and Technical Plan, Section 4; Part 8, Impact Assessment Report, Section 3, 5, 6 and 7.
BAT 4 NHIWAM 4	In order to reduce the environmental risk associated with the storage of waste. a. Optimized storage location b. Adequate storage capacity c. Safe storage operation d. Separate area for handling packaged hazardous waste.	Operations in relation to waste storage and waste handling are detailed in section 3.6 and 5 of the Management Plan. This considers, the location of incoming waste streams, potential for quarantining of materials, along with storage arrangements for outgoing products to ensure that: • Optimised storage locations - The Brookhurst Wood MBT plant is operated in accordance with the Site Management Plan and the Process Operating Manual. In accordance with the requirements of the Site Management Plan, section 4.3, the waste processing building (which includes waste reception/storage areas and the MBT process area and AD wet pre-treatment process area) is provided with impermeable pavement and engineered drainage systems to prevent a discharge to sensitive receptors. The floor of the process area directs water to an SBR/MBR treatment tank. The MBR treatment tank is located externally within a bunded contained area the tanks having leak detection and high level alarms to avoid risk of overflowing. Storage tanks for fuel and chemicals used in the treatment process have similar provisions and are also within an engineered containment bund. Secondary containment provided for all fuel and chemical storage tanks is constructed in accordance with the relevant CIRIA standards. • The process tanks associated with the AD plant are similarly located in an external bunded area with no direct connection to the drainage systems. The area is either pumped to the hydrolysis tank to be used as process water if contaminated, or to surface water if clean. • Areas have been arranged logically and as such the layout enables waste to be transferred easily between subsequent stages of the process with minimal distance. Wastes are received directly into the waste reception hall within the main process building, where they are deposited into either of the two waste reception bunkers. Materials are then subsequently transferred to the adjoining MBT processing area within the building where wastes are sorted and outputs removed for recovery or disposal. Organic wastes extracted are transferred to the adjoining AD wet pre-treatment area within the building where they are prepared for input into the main AD process. Pre-treated material is then transferred to the external area which immediately adjoins the building, from where the material is processed via a series of tanks. Materials are pumped through between successive stages of processing from hydrolysis,	Part 3, Management and Technical Plan, Sections 3.6 and 5

BAT Reference	BAT Description	Response	Application Reference
		pasteurisation and then anaerobic digestion, before a final aeration stage prior to dewatering of the final digestate. The tanks sit within a dedicated bunded area, with all transfer pipework within the bund and the proximity of tanks enables the shortest possible pipe runs. • Adequate storage capacity – The Site Management Plan documents the required storage capacity for operation of the facility at section 3.6.1 and table 3.2. This comprises incoming wastes which are stored in the two waste reception bunkers prior to treatment, as well as outputs from the mechanical separation process (which includes organic wastes prior to AD treatment) and outputs from the AD biological treatment process (which includes the treated organic waste digestate) and the new transfer and storage area. In addition to these quantities will be waste held in the external process tanks during the wet AD processes. Volumes within each of the hydrolysis, anaerobic digestion and aeration tanks are given in figures 5.5, 5.9 and 5.14 of the Process Operating Manual. • Table 3.3 of the Site Management Plan details storage times for all waste materials, including wastes undergoing treatment in the external tanks. The storage capacity, size and location of all storage areas is clearly defined by the size of the bunkers or tanks and cannot be exceeded. Storage capacity is regularly monitored and the capacities of tanks are monitored via the Scada system which controls filling and emptying of tanks. Residence times are also monitored and controlled by the Scada system, along with other key parameters that control the waste treatment processes. These are further documented in the Process Operating Manual (Appendix 3). • Safe storage operations – Waste is discharged directly into the waste reception bunkers in the waste reception area in the building and all processing is carried out indoors or in sealed tanks on the external bunded area. No materials are stored outdoors under ambient conditions. All equipment used for the processing of wastes is fully documented in the Process Operating Manual. • Containers used for storage of fuel or chemicals necessary for the waste treatment or abatement systems are stored in suitable tanks within an engineered containment bund. Leak detection and high level alarms are provided. Secondary containment provided for all fuel and chemical storage tanks is constructed in accordance with the relevant CIRIA standards. • Storage Area for Packaged Hazardous Wastes – This is not applicable as the site is not permitted to accept hazardous wastes. However, two cages are provided at the site for any quarantined hazardous waste materials.	
BAT 5 NHIWAM 4	In order to reduce the environmental risk associated with the handling and transfer of waste, BAT is to set up and implement handling and transfer procedures.	The MBT and new waste transfer and storage area are operated in accordance with defined operating and maintenance procedures including those aimed at amenity management. An overview of the procedures is provided in the Management and Technical Plan which demonstrate the relevant BAT5 criteria have been considered and incorporated as appropriate. This includes: • Handling and transfer of waste are carried out by competent staff The site is following its own IMS Training Plan (reference WS196). The plan outlines 3 key parts of training: i. Induction: mandatory training for both Biffa staff and contactors on site ii. Role Specific Training: Determined by the Role Specific Training Matrix, all staff are categorised by the job role and plans are created accordingly. iii. Task Specific Training: covering routine tasks and documented via Standard Operating Procedures (SOP). Paper copies of training certificates are kept within the personnel training files and an online database on the sites shared drive will indicate expiry dates before they are due to be renewed. • Handling and transfer of waste are duly documented The IWAP shows what waste is acceptable on site and employees are trained in handling this type of waste. Waste Transfer Notes also document and confirm that only acceptable waste is delivered to site. Refer also to BAT 2 for full details on waste acceptance. The SCADA system controls the subsequent processing of wastes, including transfer between the various stages, and contains volumes of digestate/organics in the various stages of the process, water volumes through the MBR process, and volumes of gas generated and stored. Full details are given in the Process Operating Manual. The in-vessel stage of treatment contains various time and temperature controls to comply with ABPR requirements, and these measures are validated by the SCADA system to ensure these are fully met before a batch is released from the relevant processing stage. Outputs measured are recorded via the system and auditable. Final outputs from the AD process are also sampled in accordance with the HACCP plan, for various tests to comply with ABPR requirements. • Measures are taken to prevent, detect and mitigate spills Planned Preventative maintenance ensures that equipment is safe to use and performs as designed. The design of the plant aims to reduce manual handling of waste as much as is practicable using belt transfers where possible. Once the waste has been sorted, full bins are moved by in suitable vehicles by trained Multi Skilled Operators. These measures will minimize the risk of spills when handling wastes.	Part 3, Management and Technical Plan, Section 4

<table>
<tr><th>BAT Reference</th><th>BAT Description</th><th>Response</th><th>Application Reference</th></tr>
<tr><td></td><td></td><td>All processing is carried out on impermeable pavements with engineered drainage preventing discharge to off-site receptors in the event of accidents or incidents. All storage tanks are located on impermeable pavements with appropriate bunds to contain spillages.

The procedure for dealing with chemical spillages is noted in the MRMC Site Management Plan, Section 4.3. There are also spill kits at crucial points on site which are noted on the Emergency Response Plan.

• Operations and design parameters are taken when mixing or blending wastes. The site only receives one type of waste as per the IWAP and, as such, does not require waste to be mixed or blended.

• Minimise accidents and incidents and their environmental impact

All handling and transfer procedures are risk based and the site is designed to minimise the potential for accidents and incidents as well as the potential for impact should any occur. This is in accordance with the Group Integrated Management System.</td><td></td></tr>
<tr><td>BAT 6

NHIWAM 6.4</td><td>For relevant emissions to water as identified by the inventory of waste water streams (see BAT 3), BAT is to monitor key process parameters (e.g. waste water flow, pH, temperature, conductivity, BOD) at key locations (e.g. at the inlet and/or outlet of the pre-treatment, at the inlet to the final treatment, at the point where the emission leaves the installation).</td><td rowspan="2">Waste water from the process and following treatment in a membrane bioreactor (MBR) is discharged to foul sewer under a trade effluent consent. There is therefore no direct discharge from the site to a receiving water body of process water.

With respect to the new waste treatment and storage area, all surface run off from the CLO storage area and runoff from the RDF storage area which has been confirmed as not being suitable for release into the surface water management system will be directed to the MBT facility for processing through the existing SBR tank along with MBT process water. The intention is that the majority of process/contaminated run off water will be recirculated for reuse with a small residual amount being discharged to the foul sewer in line with the existing discharge consent.

ELVs for relevant parameters and monitoring frequencies are listed in the MRMC Site Management Plan, table 4.5 and also in the trade effluent consent (as amended. The required monthly monitoring samples taken from the outlet of the MBR prior to discharge to foul sewer (i.e. outlet of pre-treatment on site and point of discharge from the site to foul sewer), are sent to an external laboratory for testing. Internal laboratory testing is also carried out daily with the results recorded on the Master Laboratory Results spreadsheet on site. Testing currently comprises pH, suspended solids, chemical oxygen demand, alkalinity, ammoniacal nitrogen, sulphate, nitrate and nitrite, in line with the trade effluent consent requirements.

Clean surface water accumulating from non-waste storage and processing areas also drains to a site lagoon from where it is discharged to surface water in accordance with the provisions of consent issued by the Environment Agency (EPR/BB3399EE). Discharge is to Boldings Brook.

In order to ensure compliance, daily samples of surface water are taken from the lagoon and analysed on-site for pH, Conductivity, Dissolved Oxygen, Suspended solids, Chemical Oxygen Demand, Ammonia, Sulphates, Chlorides. At monthly intervals samples are also taken from four sample points, 3 across the lagoon and 1 at the lagoon discharge point (Culvert A) and forwarded to an external accredited laboratory for a full suite of analysis for metals, heavy metals, ammoniacal nitrogen, chlorides, suspended solids, BOD, COD, Phenol, dissolved oxygen, pH, electrical conductivity and Oils and Grease.
In the event that discharge to foul sewer is required, a sample will be taken and analyses for the following:

<table>
<tr><th>Parameter</th><th>Standard – as below or equivalent alternative</th><th>Frequency</th></tr>
<tr><td>Chemical Oxygen Demand</td><td>ISO 6060: 1989, Water Quality - Determination of chemical oxygen demand</td><td>Only when discharge is required to take place</td></tr>
<tr><td>Total Sulphate</td><td>BS 6068: Section 2.53 1997, Determination of dissolved ions by liquid chromatography</td><td>Only when discharge is required to take place</td></tr>
<tr><td>Ammonium</td><td>BS 6068: Section 2.11 1987, Method for the determination of ammonium: automated spectrometric method</td><td>Only when discharge is required to take place</td></tr>
<tr><td>Suspended Solids</td><td>ISO 11929:1997 or EN872 - Determination of suspended solids</td><td>Only when discharge is required to take place</td></tr>
</table></td><td rowspan="2">Part 3, Management and Technical Plan, Section 4.6</td></tr>
<tr><td>BAT 7

NHIWAM 7.3</td><td>BAT is to monitor emissions to water with at least the frequency given below, and in accordance with EN standards. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality.</td></tr>
<tr><td>BAT 8

NHIWAM 7.1</td><td>BAT is to monitor channelled emissions to air with at least the frequency given below, and in accordance with EN standards. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality.</td><td>The requirements of this BAT conclusion relate to monitoring associated with BAT 34. An assessment of the requirements that would apply under BAT 34 to biological treatment of waste dictates that 6 monthly sampling/monitoring would be required for hydrogen sulphide, ammonia and odour. This would be carried out in relation to the biofilter outputs. The footnotes to the table under BAT 8 state that odour can be used instead of hydrogen sulphide and ammonia and that hydrogen sulphide and ammonia can be used instead of odour.

Currently, daily odour monitoring/assessment is undertaken by site staff in accordance with the Odour Management Plan (Appendix 16) which has been requested by the EA. Annual emissions monitoring is also undertaken by an accredited laboratory on the gas engines and emission point stack for the odour abatement system. This monitoring includes volatile organic compounds from the gas engines and particulate matter from the stack for the odour abatement system. Daily VOC testing is also undertaken by the on-site laboratory from the carbon filter outlet prior to its discharging to the stack.

In the event that the Agency impose requirements to implement further measures at the facility to address BAT 8, this may include:</td><td></td></tr>
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BAT Reference	BAT Description	Response	Application Reference
		a. 6 monthly sampling from the emission point to the air extraction abatement system for ammonia and hydrogen sulphide, odour and total volatile organic compounds. Hydrogen sulphide and ammonia determination may be alternated with odour during successive 6 monthly sampling rounds so that either hydrogen sulphide and ammonia or odour will be sampled and monitored. As the odour abatement system includes a wet scrubber which would remove potential dust emissions, six monthly sampling for particulates is not proposed, but an annual sample will continue to be taken as currently. All waste handling operations take place indoors and all potential emissions are routed through the abatement system. b. Annual emissions testing will continue to be carried out on emissions from the gas engines. It is considered reasonable to test the gas engines at an annual frequency in line with the frequency on landfill related gas engines. If required by the Agency, the current annual emissions testing may be expanded to include ammonia and sulphide (which act as a surrogate for odour) and also total particulate matter (dust). It is not considered necessary to carry out emissions testing on the gas flare as this is in use for less than 10% of the time, this being in line with the approach on landfill related gas flares. The gas flare is only provided as an emergency back-up facility to the gas combustion engines. A monitoring scheme would be prepared and forwarded to the Agency for approval 3 months prior to implementation of any requested changes. Once approved, the scheme would then be implemented.	
BAT 9 NHIWAM &.1	BAT is to monitor diffuse emissions of organic compounds to air from the regeneration of spent solvents, the decontamination of equipment containing POPs with solvents, and the physico-chemical treatment of solvents for the recovery of their calorific value, at least once per year using one or a combination of the techniques given below.	N/A – no solvents or similar materials are accepted at the MBT facility	-
BAT 10 NHIWAM 2.1 and 6.3	BAT is to periodically monitor odour emissions	The MBT and associated waste transfer and storage area have a defined Odour Management Plan (OMP) which includes details of the odour monitoring regime at the site. This includes details of site monitoring which includes: • Daily sniff testing; • Recording of meteorological conditions; and • Dynamic olfactory monitoring (e.g. EN 13725 or EN 16841-1 or -2) or suitable alternative in the event that substantiated odour complaints area received.	Part 4, Odour Management Plan
BAT 11 NHIWAM 8.1, 8.2, 8.3 & 9	BAT is to monitor the annual consumption of water, energy and raw materials as well as the annual generation of residues and wastewater, with a frequency of at least once per year.	Details of the expected annual consumption of water, energy and raw materials and residue management is detailed in the Management and Technical Plan, Section 3.6.7. This includes monitoring of the annual consumption and generation rates as appropriate which is a requirement under the corporate EMS. Monitoring and reporting of annual water, energy and raw materials consumption, along with annual generation of residues and waste water, is included with the annual report under the current Permit conditions. On site sampling which supports the above submission comprises monitoring of both consumption of raw materials (and renewable energy) as well as monitoring of generation of wastes. a. Consumption: • Potable water and rainwater: weekly readings are taken from onsite meters and recorded on the Meter Readings spreadsheet. Volumes declared on the annual EA report document Reporting Form Water Usage 1 v2. • Energy from grid and site: weekly readings are taken from onsite meters and recorded on the Meter Readings spreadsheets. These are declared on the annual EA report document Reporting Form Energy 1. • Raw Materials – are ordered by the Operations Manager who does a stock take of all materials each week and orders what is needed. The quantity of process chemicals is not constant as it fluctuates with the variations in composition of the waste received that needs to be treated. The materials used and ordered are logged on an internal spreadsheet. b. Generation of wastes: Wastewater that is generated from waste processing is filtered through an MBR as per the Process Operating Manual – Section 4.6.2 (Appendix 3). This is then discharged out to the local sewer under Trade Effluent Discharge Consent 14695 from Southern Water (Appendices 27 and 28). The output volumes are monitored via the SCADA system. Residue that is generated from the mechanical waste sorting process that cannot be recovered is sent to landfill. These weights are loaded on to a computer system which generates a weighbridge ticket for each load. The sludge residue generated from the MBR filtration system is fed back into the anaerobic digestion process. This is monitored using the SCADA system.	Part 3 Management and Technical Plan
BAT 12 NHIWAM 2.1 & 6.2	In order to prevent or, where that is not practicable, to reduce odour emissions, BAT is to set up, implement and regularly review an odour management plan, as part of the environmental management system	The MBT and associated waste transfer and storage area has a defined Odour Management Plan (OMP) which includes details of: • controls and mitigations during normal operations, maintenance and abnormal operations; • odour monitoring regime at the site; • response to odour complaints and incidents. Protocols containing actions and timelines such as: 1. Front hall operations (Section 2.1.1 of the OMP) – doors kept closed, area under negative pressure, waste rotation	Part 4, Odour Management Plan

BAT Reference	BAT Description	Response	Application Reference
		2. Odour abatement system (Section 2.3 of the OMP) – describes air extraction (includes schematic of air extraction system Fig 2.1 of the OMP) as well as air treatment • Protocols for conducting odour monitoring (Section 4 of the OMP) - as per BAT 10. • Complaints handling procedure – Appendix 3 of the OMP • Odour prevention/reduction programme. Odour sources were characterized and identified when the plant was built, and appropriate measures put in place such as the odour abatement system. Due to the nature of the plant, it is unlikely that there will ever be total odour prevention, however new technology is constantly being reviewed and implemented where possible. Section 2.3.5 of the OMP details that emissions from the stack are monitored daily and the activated carbon replaced when necessary.	
BAT 13 NHIWAM 2.1 & 6.2 In order to prevent or, where that is not practicable, to reduce odour emissions, BAT is to use one or a combination of the techniques given below.		The MBT and associated waste transfer and storage area has a defined Odour Management Plan (OMP) which includes details of the controls and mitigations to be employed during normal operations, maintenance and abnormal operations. Techniques employed at the existing MBT facility were previously assessed as BAT at the time of the previous application and as no changes are proposed for these operations in this variation, they are considered to continue to meet BAT and comprise the following: • ***Minimising residence times*** The waste is rotated in the reception bunkers (pits) in the building to ensure that older waste is treated first. In order to prevent old waste building up at the bottom of the pits, thus elevating levels of odour, the crane operators will spend a period of time after the day's operations turning the pits over. The waste taken from the bottom of the pit is then processed at the start of the following day. Outputs are removed from site with frequencies as per Table 1 in the Odour Management Plan (Appendix 16). Incoming waste usually averages at about 600t per day and weights are logged and tracked on the central system. The pits are designed to be able to hold 2 days' worth of projected tonnage which is able to accommodate seasonal peaks – Section 3.4 of Odour Management Plan. • ***Using chemical treatment*** A misting system is installed above each of the reception bunkers to suppress odour coming from waste in the bunkers. To prevent fugitive emissions air is extracted from the waste reception hall, the mechanical pre-treatment area and the wet pre-treatment areas within the building. This is largely done via large steel ducts which draw in air through a series of grills, although highly odorous areas such as over screens and at the interchange of conveyor belts there are extraction hoods which are connected directly to the main extract ducts to provide localised extraction. In the wet pre-treatment area, sludge mixing tanks and settlement tanks are also connected directly to the extraction system to allow for air extraction from the head spaces. To prevent venting from tanks in the AD area, comprising the hydrolysis tank, process water tank, aeration tank, MBR tank, pasteurisation tanks and external liquid waste tank, exhaust air pipework from these tanks joins a common duct, and first passes through a chilled water scrubber before joining the air stream from the process building. The operation of the chilled water scrubber is monitored from the SCADA control system. The dryer building contains a hot air dryer which uses heat from the CHP engine exhaust to dry dewatered digestate. Odorous air is extracted from this building, as well as decanter and screw conveyor areas and the four digestate offloading bays in the dryer building which are fitted with exhaust hoods. The plant makes use of a caustic scrubber to absorb acid gases such as H_2S from the exhaust air before it is polished on the biofilters and activated carbon filter and then discharged at the stack. There are 5 bioreactor vessels designed to treat odour in the exhaust air before discharge. Crucial elements of bioreactors are monitored via SCADA system. If pH, flow and temperature are all within working parameters the bioreactors should function correctly. Operating performance is again monitored via SCADA. When the carbon filter is in use, airflow from the inlet and outlet of the system is sampled and analysed for VOCs using a PID analyser, to monitor the effectiveness of the system in reducing VOCs at daily intervals. Section 4.8.3 of the Process Operating Manual (Appendix 3). Ferric chloride is also used during the wet pre-treatment, hydrolysis and anaerobic digestion processes to manage hydrogen sulphide in exhaust air and biogas. Section 4.7 of the Process Operating Manual. • ***Optimising aerobic treatment*** The accepted plant design utilises air in the following processes: bioreactors, aeration tank and membrane bioreactor. Pure oxygen is not being used at this point. Scum layers are prevented by using mechanical agitation in the process tanks. Foam layer in aeration tank and Membrane Bioreactor (MBR) is controlled by using anti-foaming agents. Section 5.7.2 of the Process Operating Manual (Appendix 3). Dissolved oxygen in MBR is monitored by the SCADA system and flow of air is regulated to maintain suitable oxygen concentration in the tank.	Part 4, Odour Management Plan, Sections 6, 7 and 8.

BAT Reference	BAT Description	Response	Application Reference
		The aeration systems are regularly maintained as per the schedule within the Computerised Maintenance Management System (CMMS). Other techniques include: • enclosing the waste reception area by using high-sided bay walls and a free-standing cantilever roof canopy; • applying the first in, first out (FIFO) principle; • using water suppression (with odour masking substances if necessary) on stockpiles of pre-treated and treated materials; and • maintaining high standards of housekeeping.	
BAT 14 NHIWAM 2.1 & 6.2 In order to prevent or, where that is not practicable, to reduce diffuse emissions to air, in particular of dust, organic compounds and odour, BAT is to use an appropriate combination of the techniques given below.		The main diffuse emissions from the MBT facility will be associated with the new external waste transfer and storage area which are characterised in the Impact Assessment Report (IAR). The site also has a separate Odour Management Plan and Dust Management Plan. This IAR document also details the controls and mitigation measures to be employed within the risk assessment which reinforces the measures detailed in the Management and Technical Plan in relation to wider amenity management, in the OMP and in the DEMP. **<u>Controls At Main MBT Building</u>** Techniques employed at the existing MBT facility were previously assessed as BAT at the time of the previous application and as no changes are proposed for these operations in this variation, they are considered to continue to meet BAT and comprise the following: • ***Minimising the number of potential diffuse emissions*** • The plant was designed using the best layout for the confined footprint and as such the placement and number of pipes etc was optimised. Material is moved through the processes using screws or conveyor belts where possible. The drop height is limited to the space required to move the material without obstruction. Please see Section 4.3 of the Process Operating Manual. • All vehicles are subject to the site speed limit as per Section 4.7.1 of the Site Management Plan which identifies the measures used to reduce the potential of dust and particulates. • The plant is built in a natural depression and is surrounded by a road, a landfill, brickworks, and bund constructed by the neighbouring recycling centre and does not pose a dust concern. Tree screening around the site provides a further wind barrier. The onsite roads are swept on a daily basis. Once received all waste is processed indoors further reducing potential for diffuse emissions of dusts and an odour abatement system controls odours from the waste receipt, storage, handling and processing operations. • ***Selection of high integrity equipment*** At development, each section of the plant was discussed, and the best materials chosen for the associated processes, containers, etc. This was tracked via Annex 17 – HAZOP which lists the items addressed. • ***Corrosion prevention*** At development, each section of the plant was discussed, and the materials chosen for the associated processes, containers, etc. This was tracked via Annex 17 – HAZOP which lists the items addressed. The mechanical part of the plant was assessed during design and construction phase and appropriate materials selected. • ***Containment, collection and treatment of diffuse emissions*** • The plant was designed for all processes to be contained either within buildings or closed tanks - Annex 17 – HAZOP. • Pressures throughout the system are described in the Process Operating Manual (Appendix 3) and monitored and maintained via SCADA. • An extraction system is in place that draws odorous air from all areas of the plant through to an odour abatement system – Fig 2.1 in the Odour Management Plan. The odour extraction system also contains dust filters. • ***Dampening*** The front hall has a misting system that dampens both odours and dust arising from incoming and stored waste – Section 3.4 of the Odour Management Plan. • ***Maintenance***	Part 8, Impact Assessment Report Part 3, Management and Technical Plan, Section 4 Part 4, Odour Management Plan Part 5, Dust Management Plan

BAT Reference	BAT Description	Response	Application Reference
		The plant was designed to allow access to all equipment as per Annex 17 – HAZOP and is regularly maintained as per relevant schedules within the Computerised Maintenance Management System (CMMS). Fast acting doors on site are also maintained using this system. Dust filters are also regularly checked and maintained by a specialist contractor as per the relevant CMMS schedule. • ***Cleaning of waste treatment and storage areas*** Cleaning of the plant is done daily and is checked by shift supervisors in their daily walkaround as per the Post Ops & Monthly Lists checklists (refer to section 3.8 of the Odour Management Plan. Local dust filters are cleaned manually by Plant Operatives and main dust filters are equipped with automated self-cleaning systems. • ***Leak detection and repair*** Leaks are monitored by the shift supervisors on their daily walkaround and results recorded on the Odour Monitoring Form. Any leaks detected are then recorded on the Near Miss Hazard Tracker. Repairs are carried out according to severity and urgency. Quarterly inspections of the building skin will be performed to review integrity of the structure and repair where necessary. This will be tracked in the Computerised Maintenance Management System (CMMS). At development, each section of the plant was discussed, and risks of leaks considered and appropriate design and mitigation put in place. This was tracked via Annex 17 – HAZOP which lists the items addressed. **<u>New Waste Transfer and Storage Area</u>** Techniques to be employed at the new waste transfer and storage area for the control of diffuse emissions of dust, odour and litter are fully detailed in the separate OMP and DEMP In terms of BAT the main techniques include: • **Minimising Diffuse Emissions During Transfer and Storage** a. Loading of loose RDF and CLO into the containers for offsite transfer will take place inside the MBT building which is equipped with an extraction system to control odours and fast acting doors. Closed containers will be transferred for temporary storage at the new waste storage and transfer area. b. No handling or processing of loose RDF or CLO will take place outside the MBT Building and once final containers are filled inside the MBT building, they will be closed/sealed, and they will remain closed until they are transferred off-site. c. Loading of baled and plastic wrapped RDF onto curtain-sided trailers will take place either inside the MBT building or adjacent to MBT door. Curtains will be secured prior to transfer for storage at the new waste storage and transfer area. No further handling or processing of the baled RDF will take place in the new waste storage and transfer area. d. The new waste transfer and storage area will be constructed on a new concrete pad and RDF vehicles will be parked in designated storage bays with walls on three sides. This provides protection from the wind in the event a spillage takes place. e. All vehicles using the new transfer and storage area will be subject to the site speed limits as detailed in Section 4.7.1 of the Site Management and Technical Plan. • **Selection of Equipment With High Integrity** a. Sealed/enclosed containers will be used for the storage of loose RDF and storage of CLO. The final type and specification of the containers has still to be confirmed but is likely to include ROROs or shipping containers. b. Baled RDF will be compacted and sealed with stretch wrapping prior to loading onto pallets ready for dispatch. • **Corrosion Prevention** Containers selected for the storage of loose RDF or CLO will be constructed from stainless steel or similar rust resistant material. Containers will be inspected before use to ensure that no damage or corrosion has occurred that would affect the integrity of the container. • **Containment, Collection and Treatment of Diffuse Emissions** a. Loose RDF will be loaded into haulage vehicles with sealed/enclosed containers – the final type and specification of the containers has still to be confirmed but is likely to include ROROs or shipping containers. Loading of the containers will take place inside the MBT building. Containers are then sealed before the vehicle leaves the building.	

BAT Reference	BAT Description	Response	Application Reference
		b. Baled and plastic wrapped RDF will be loaded into curtain sided trailers inside or adjacent to the MBT building and the curtain secured before the trailer is transferred to the new waste storage and transfer area. l c. Dewatered digestate/CLO will be loaded into enclosed container within the enclosed MBT building and containers sealed before leaving the building. Similar to the loose RDF the final type and specification of the containers has still to be confirmed but is likely to include ROROs or shipping containers. d. All containers, wagons and trailers transferred to the new waste storage and transfer area will remain on site for no longer than 72 hours and are not accessed or opened again during this time. • **Dampening** Although emissions from sealed containers/curtain siders is unlikely, the Operator will ensure suppression equipment is available in the event of dust emissions. • **Maintenance** No processing is undertaken at the new waste transfer and storage area and no processing equipment is present. Plant that is involved in loading of the vehicles are subject to pre-use checks and planned preventative maintenance as detailed in the Management and Technical Plan. The MBT is maintained as described above. • **Cleaning of Waste Transfer and Storage Area** a. The new waste storage and transfer area will be constructed with impermeable surfacing across the new external waste transfer and storage area; b. Maintenance of high standards of housekeeping in the area through: (i) Cleaning of the area will be done daily and is checked by shift supervisors in their daily walkaround as per the Post Ops & Monthly Lists checklists (refer to section 3.8 of the Odour Management Plan. (ii) Hauliers are responsible for ensuring the wagon body is completely cleared of waste when they tip at the end destination. (iii) CLO containers/RORO are subject to inspection when empty and will be cleaned if inspection identifies waste accumulation in the container. • **Leak Detection and Repair** There is no pipework associated with the new transfer area and potential for leaks will be associated with the storage containers used for the storage of RDF and CLO. Checks for fugitive releases will be monitored by the shift supervisors on their daily walkaround and results recorded on the Odour Monitoring Form. Any leaks detected will then be recorded on the Near Miss Hazard Tracker. Repairs and corrective action will be carried out according to severity and urgency. This is in accordance with the established procedure at the main MBT building. **<u>Leak Detection and Repair (LDAR) Programme</u>** The main MBT site comprises an anaerobic digestion process with associated combustion of the produced gas in gas engines. The Operator is currently preparing an LDAR plan to meet the requirements of a new Improvement Condition identified during the recent BAT Regulation 61 review for the existing MBT processes. As the site does not accept wastes with the potential to release diffuse organic compounds no LDAR programme is required for the new Waste Transfer and Storage Area.	
BAT 15	BAT is to use flaring only for safety reasons or for non-routine operating conditions (e.g. start-ups, shutdowns) by using both of the techniques given below.	BAT is to use flaring only for safety reasons or non-routine operating conditions (start-ups, shutdowns by the following: • Correct plant design to include provision of a gas recovery system with sufficient capacity and use of high-integrity relief valves, and plant management including balancing of the gas system and advanced process control • The Gas Storage tank provided equalises the pressure in the Biogas System, which is affected by fluctuating levels and gas production rates in the Digester tanks. By pressure equalisation the produced biogas flows via the biogas ducts into the Gas Storage. The Gas Storage consists of two membranes. The inner encloses the actual Gas Storage and collapses/expands depending on the gas filling level. The filling level of the Gas Storage in measured by an ultrasonic sensor which measures the distance between the two membranes. The space between the inner and outer membrane is pressurised by means of air blowers with outside air. The system has two air blowers, one for duty operation and one for standby. During operation small	Part 3, Management and Technical Plan, Sections 3.6 and 4 -

BAT Reference	BAT Description	Response	Application Reference
		amounts of biogas can diffuse through the inner membrane. It is subsequently flushed out by the continuous stream of air. A larger leak from the inner membrane will be detected by methane sensors. • Biogas, produced from Digesters has a relative humidity of approximately 100%. To reach a point of optimal combustion it has to be conditioned. This requires a heat exchanger with a water chiller and demister. The biogas is cooled to a temperature of approximately 10oC. The generated condensate is collected in the demister and drained to a Condensate Well. The cooled biogas is compressed to the required inlet pressure for the downstream consumers by means of gas booster fans. Biogas is then used to power the Combined Heat and Power (CHP) Plant and the boiler. The CHPs are a process step with three internal combustion engines, each in combination with an electric generator, to produce electrical power from biogas and also to support the required thermal power for the process. For heating purposes, thermal energy is derived from the motor cooling water and from exhaust air by means of heat exchangers. The thermal energy is mainly used for the operation of Pasteurisation. • Under certain circumstances such as CHP plant failure, biogas has to be flared by the Gas Flare to avoid emission of harmful gases to the environment. In order to full degrade organic substances within the biogas, the Flare is designed to operate at a temperature in excess of 800oC during operation. This will ensure complete oxidation of methane. It can be seen that the flare use is minimal with the above system and controls, and is limited to non-routine conditions only. The plant design includes a sophisticated gas recovery system, with capacity designed to handle gas produced within the digesters being handled by up to three combustion engines and a gas storage facility which will provide buffering capacity to balance against fluctuations in flow. The gas flare consequently is required for non-routine conditions only. Even with starts ups for monthly testing the flare is in use for less than 10% of the time. Further details on the gas recovery system are provided in section 4.7 of the Process Operating Manual at Appendix 3. Section 5.10 of the Process Operating Manual gives further detail on the SCADA control of the gas recovery system.	
BAT 16 In order to reduce emissions to air from flares when flaring is unavoidable, BAT is to use both of the techniques given below.		BAT is to reduce emissions to air from flares when flaring is unavoidable by the following: ***Correct design of flaring to ensure efficient combustion and monitoring and recording as part of flare management.*** Section 4.7.4 of the Process Operating Manual (Appendix 3) describes the gas flare which is designed to ensure complete oxidation of methane extracted from the anaerobic digestion tanks. Operation of the gas recovery system and flares is described in detail in the section 5.10.2 of the Process Operating Manual (Appendix 3). The SCADA system measures gas flows leaving all digesters and logs flows. The plant also records other parameters such as hydrogen sulphide, oxygen, methane, with treatment incorporated to control the concentration of hydrogen sulphide which is otherwise corrosive to the plant, and controls in place to keep oxygen concentrations within the biogas to acceptable levels to reduce risk of explosion. The quality of the gas to the gas buffer is therefore automatically controlled by the SCADA system. The gas level in the gas buffer (storage) is measured by the SCADA system and the flare is only activated when the gas level reaches a pre-set limit to remove excess gas and prevent an overflow of gas from the gas buffer to atmosphere. Gas flow rates to the flare are also controlled by the SCADA, which will record total volumes flared. Where the gas flare is tested (monthly intervals) the event is logged in the CMMS system and usage included in reporting to the EA.	
BAT 17 NHIWAM 2.1 & 6.3 In order to prevent or, where that is not practicable, to reduce noise and vibration emissions, BAT is to set up, implement and regularly review a noise and vibration management plan, as part of the environmental management system (see BAT 1), that includes all of the following elements		An assessment of noise impact was completed to support the original Planning and Permit Applications for the existing MBT facility and as no changes are proposed to these operations, the previous assessment is considered to remain valid. A noise assessment has been completed as part of this permit variation on the new proposed Waste Transfer and Storage area which has concluded that noise levels from the new area were below both existing and derived noise limits at all receptor locations. This assessment is provided as an appendix to the Impact Assessment Report Please refer to the Noise and Vibration Management Plan at section 4.4 of the Site Management Plan. Maintenance work on equipment is scheduled and carried out by competent staff to ensure that equipment operates within manufacturer's limits and reduces noise and vibration. Noise monitoring is carried out at monthly intervals. The noise monitoring is carried out in accordance with a site guidance note (procedure) which details sensitive receptors and adjoining monitoring locations, procedures for monitoring and recording of results. A complaints procedure is in place at the facility. This includes detailed procedures for investigation and reporting of all complaints including noise.	Part 8, Impact Assessment Report, Appendix A Part 3, Management and Technical Plan, Section 4 Part 6, Noise and Vibration Management Plan
BAT 18 NHIWAM 2.1 & 6.3 In order to prevent or, where that is not practicable, to reduce noise and vibration emissions, BAT is to use one or a combination of the techniques given below.		• ***Appropriate location of equipment and buildings*** – The Brookhurst MBT facility is constructed within the base of a quarry and benefits from screening to the nearest residential receptors (located to the east and south east of the site) by the quarry walls. Substantial further screening and noise attenuation is also provided along these boundaries by a belt of mature deciduous trees. This has the effect of blocking views of the facility and screening from noise. The other sides of the facility are bounded and screened to the north by the flanks of a nearly completed landfill site with a further belt of mature trees at the northern boundary of the landfill and to the west by an adjoining brickworks with a belt of mature trees beyond that. The facility is well situated to minimise impact from noise generated by the permitted activities. All wastes are received and deposited within the main building at the facility and all waste processing takes place within the building or within tanks for subsequent stages, such that noise from the activities can be attenuated. • ***Operational measures*** – Section 4.4 of the Site Management Plan deals with noise and vibration management. This documents that all plant and equipment at the site will be maintained in accordance with the manufacturer's recommendations. All plant has a planned preventative maintenance program in place, carried out by trained and experienced people. Fast acting doors are in use and kept closed except during deliveries, with all waste handling and processing being indoors. Plant and equipment will be stopped when not in use to minimise noise emissions. • ***Low equipment noise*** –Pumps and compressors are sited within the building or enclosures which provides a noise barrier to sensitive receptors. Site plant is fitted with white noise reversing alarms to reduce potential noise emissions.	Part 8, Impact Assessment Report, Appendix A Part 3, Management and Technical Plan, Section 4 Part 6, Noise and Vibration Management Plan

BAT Reference	BAT Description	Response	Application Reference
		• ***Noise and vibration control equipment*** –Cladding on the process building provides acoustic attenuation. Motors associated with external tanks and pumps are also acoustically enclosed. • ***Noise attenuation –*** The building provides a barrier to the nearest receptors as does the location of the facility in the base of a quarry with mature tree belts at the perimeter of the quarry providing a further barrier to noise propagation.	
BAT 19 NHIWAM 8.1, 8.2, 8.3 & 9	In order to optimise water consumption, to reduce the volume of wastewater generated and to prevent or, where that is not practicable, to reduce emissions to soil and water, BAT is to use an appropriate combination of the techniques given below: 1. Water management 2. Water recirculation 3. Impermeable surface 4. Reduce likelihood/impact of tank/vessel overflow 5. Roofing of waste storage areas 6. Segregation of water streams 7. Adequate drainage infrastructure 8. Detection and repair of leaks 9. Appropriate buffer storage.	***Water management*** Consideration of water usage and disposal of effluent was a key consideration during design of the facility. During normal operations, rainwater is harvested and used in many processes. Refer to Rainwater Harvesting Schematic – drawing M-09-SM-XX-4003 supplied previously. Should this not be available for any reason (dry season, maintenance, etc) then the system can be switched over to mains water. The movement of water throughout the process is indicated by the West Sussex Block Diagram. Triggers are used in all jet washing equipment used in the plant itself which stops the flow of water once released. On the wheel wash station, motion detectors are used on wheel wash to stop the flow of water once a vehicle has passed through. The Process Operating Manual (supplied previously) describes the use of dry ways of cleaning such as sweeping. ***Water recirculation*** The wet pre-treatment process uses a combination of recirculated process water, mains water and surface water/rainwater. Once material has gone through the anaerobic digestion process, it is then dewatered and this water is fed back into the wet pre-treatment system – see Sections 4.4, 4.5 and 4.6 of the Process Operating Manual (supplied previously). **Impermeable surface** The entire site, including ground floor processing areas within all buildings, is floored with impermeable concrete as per design specifications – Q21 In-situ Concrete Roads Pavings Bases. ***Techniques to reduce likelihood and impact of overflows and failures from tanks and vessels*** Levels on all tanks are monitored via the SCADA system which will bring up an alert if a level is breached. Overflow pipes are directed allow flow to be directed to appropriate drainage systems. All tanks are equipped with appropriate isolation valves and are contained within bunds that are designed to be large enough capture 110% of the largest tank in the bund. Refer to the Structure Operation and Maintenance Report which gives detail on construction of bunds. ***Roofing of waste storage and treatment areas*** All waste and processing are contained within enclosed buildings as per the Structure Operation and Maintenance Report. ***Segregation of water streams*** Water streams are segregated and fed to appropriate drainage or treatment systems and are referenced throughout the Process Operating Manual (supplied previously). Any leachate from waste is contained within this system. ***Adequate drainage infrastructure*** All waste treatment and storage areas are provided with the above impermeable pavements and sealed drainage systems.. Rainwater falling within bunds may be used as process water. All used process water is pre-treated prior to discharge to foul sewer. The Biffa West Sussex Emergency Response Plan – document WS073 (supplied previously), also contains a suite of drawings at sections 4a and 4b. Section 4a (Drainage Plan General Arrangement) shows the drainage arrangement for the whole facility, and section 4b (Site Drainage Plan – Schematic of surface water drainage) gives further detail on the control of drainage flows. ***Design and maintenance provisions to allow detection and repair of leaks*** The plant was designed to allow access to all equipment as per Annex 17 – HAZOP supplied previously and is regularly maintained as per relevant schedules within the Computerised Maintenance Management System (CMMS). Leaks are monitored by all staff. Any leaks detected are then recorded on the Near Miss Hazard Tracker and repaired according to urgency. ***Appropriate buffer storage capacity*** Under normal operating conditions, the Membrane Bioreactor (MBR) is able to treat and discharge waste water into the local municipal sewer system. In adverse conditions, excess waste water is tankered off site to be treated at another specialist water processing site – Section 5.14.2.2 of the Process Operating Manual supplied previously. A currently unused digester tank with 5300m3 capacity is being used as a buffer for surplus process water. ***New Transfer & Storage Area*** Arrangements for the new transfer and storage area include:	Part 3, Management and Technical Plan, Section 5

BAT Reference	BAT Description	Response	Application Reference
		• Water is recirculated from the process, from the CLO drainage system and where necessary from the surface water management system by treating in an SBR process to achieve the quality required for reuse; • The MBT and associated waste transfer and storage area is constructed with an impermeable surface in waste storage and treatment areas with falls to collection drains which facilitate potentially contaminated water being directed through the SBR treatment plant prior to recirculation in process; • Tanks and vessels within the MBT/AD installation boundary are proprietary design, situated on impermeable surface, with level monitoring and alarms and containment equivalent to 110% tanks volume or 25% of the total capacity of the system storage capacity, whichever is greatest; • The drainage system is structured such that clean surface run off is kept separate from potentially contaminated run off - clean run-off will drain to the MBT surface water lagoons prior to discharge when needed to Boldings Brook. • Site mobile and processing plant will be subject to daily visual inspection and planned preventative maintenance which will minimize the risk of leaks; and • All potentially contaminated water will be treated and any which cannot be recirculated for use in the MBT process will be discharged via foul sewer.	
BAT 20 NHIWAM 6.4 In order to reduce emissions to water, BAT is to treat wastewater using an appropriate combination of the techniques given below.		Waste process water is collected and subject to pre-treatment before discharge to foul sewer from the facility. Discharge takes place under trade effluent consent 14695 issued by Southern Water and subsequently varied. The discharged trade effluent is then subject to biological treatment at the waste water treatment works before final discharge to the receiving water. Biffa operate a MBR which is capable of treating up to 150 m3 of process water per day. The process water is generated in the AD process by dewatering digested and aerated substrate using polymer to enhance settling rates. Process water is filtered over a Baleen Filter to remove suspended solids. The filtered process water is then stored in a Baleen Tank. The filtered process water is then recirculated through a chiller unit where it is reduced in temperature by approximately 6 degrees. The chilled process water is then fed to the MBR using duty/standby feed pumps. The MBR process combines aerobic biodegradation and ultra-filtration (UF) for the removal of ammoniacal nitrogen and dissolved organic compounds. Mixed liquor from the MBR is pumped at an optimized constant flow rate through the externally positioned tubular filtration membranes. In this process the mixed liquor from the MBR is fed into the filtration system and is separated in the UF membrane modules into a clear permeate and a pumpable sludge known as retentate. The clear permeate is fed preferentially to the backwash tank and then subsequently to the underground discharge tank prior to discharging to sewer. The retentate which contains active bacteria is returned back into the MBR. The MBR process is managed by a Programmable Logic Controller (PLC) which is installed in a control panel located in the MCC Room within the dryer building. The PLC communicates with SCADA, which along with the installed HMI screen are the Operator interface for the MBR process. Sodium bicarbonate is added to increase/maintain a sufficient alkalinity concentration which has a significant impact on the ability to remove ammonia. Perversely, the nitrification process generates acidity and this drives down the pH and it is necessary to dose caustic soda solution into the bioreactor in order to maintain the correct pH level and thus ensure a constant supply of this food source. The process typically creates foaming and this is controlled by dosing with anti-foam solution. Full details of the pre-treatment of process water are contained in section 4.6.2 of the Process Operating Manual (supplied previously). The membrane bioreactor complies with the BAT standard for biological treatment. Overall the BAT standard (BAT20) requires an appropriate combination of techniques. It can be seen that the above, as well as incorporating biological treatment, uses this in conjunction with physical separate (to removed suspended solids), denitrification, filtration and pH adjustment (neutralisation). As there is no direct discharge from the site to receiving water, the BAT AELs in table 6-1 are not considered to apply to the Brookhurst Wood MBT facility. BAT AELs in table 6-2 would be applicable to the mechanical biological treatment process at the Brookhurst Wood MBT facility for the following determinants: Arsenic Cadmium Chromium Copper Lead Nickel Mercury Zinc However it is recommended that BAT AELs are not directly applied to the Brookhurst Wood MBT facility as these are not directly discharged to receiving water and further abatement would take place at waste water treatment plant operated by Southern Water. Testing of the above will be in accordance with the requirements of BAT 7 and will be implemented as outlined under the response to BAT 7.	
BAT 21 NHIWAM 2.3, 2.4 & 2.5	In order to prevent or limit the environmental consequences of accidents and incidents, BAT is to use all of the techniques given below, as part of the accident management plan (see BAT 1). a. Protection measures	Details of the site accident management arrangements are provided in the Management Plan and Impact Assessment . These arrangements include appropriate: • Protection measures - The site is provided with suitable site security which reduces risk for malevolent acts to the plant. This includes site security fencing and provision of CCTV. These are dealt with in section 6.3.2 of the Site Management Plan (Appendix 2). The Fire Risk Assessment documents all	Part 3, Management and Technical Plan, Sections 6 and 7 Part 7, Fire Prevention Plan

BAT Reference	BAT Description	Response	Application Reference
	b. Management of incidental/accidental emissions c. Incident/accident registration and assessment system	measures for prevention, detection and extinguishing of fires. Site operatives, including fire marshals, are given appropriate training in the event of a fire. In the event of a fire affecting the SCADA control room a second SCADA control station is available remotely in the drier building . • Management of incidental/accidental emissions – The Fire Risk Assessment details measures to be taken to minimise risk of fire, bring a under control within required timescales to limit overall impact from combustion emissions and to contain firewater. Supporting guidance to the EMS (Emergency Planning and Business Continuity – document MOG17) gives further detail on the management of accidents and emergencies and the Emergency Response Plan deals with measures to be taken in relation to all incidents and emergencies. See also section 6 of the Site Management Plan • Incident/accident registration and assessment system. – All accidents and near misses are logged on site on the internal compliance database, as well as inspection/investigation reports by the companies SHQ team. In accordance with Group Standard GS17, site emergency plans are maintained and reviewed annually, or following significant changes or incidents at the facility. Procedures are in place relating to identifying, responding to and learning from accidents and incidents via the SHQ team and via monthly Site Safety Improvement Team (SIT) meetings. Staff will be trained in site emergency response procedures (ERP) which are tested through drills to evaluate the effectiveness. Abnormal operations including those which can give rise to accidental releases and emergency situations have been assessed within the Impact Assessment Report. Arrangements with respect to residue management are detailed in the Technical Plan, Section 6	Part 8, Impact Assessment Report, Section 6 and Appendix E
BAT 22 NHIWAM 9	In order to use materials efficiently, BAT is to substitute materials with waste.	Although Biffa considers that this requirement is being complied with, it is highlighted that limited scope exists to substitute products with wastes, and therefore only limited cases exist. Process water is recirculated in the wet pre-treatment stage. Surface water/rainwater is captured and also fed into the wet pre-treatment stage, rather than being discharged from the site to surface water courses. Refer to the Process Operating Manual section 5.14.2.2 (previously supplied). This reduces demand on potable mains water supplies. No other waste generated on site is suitable for use in other parts of the operation.	
BAT 23 NHIWAM 8.1	In order to use energy efficiently, BAT is to use both of the techniques given below. a. Energy efficiency plan b. Energy balance record	Details of energy management arrangements at the site are provided in Section 5 of the Management and Technical Plan – these include both energy efficiency plan and energy monitoring arrangements ***Energy efficiency plan*** The plant functions within the design parameters as per the Process Operating Manual and, as such, energy usage per tonne of waste processed is relatively consistent. Therefore, no KPIs are specifically set for this point. An energy efficiency plan has been created. Whilst this is currently out of date, it will be placed on the Document Management spreadsheet to ensure that it is reviewed annually going forwards. There have been energy saving initiatives such as a. changing light bulbs to the energy efficient version; and b. changing processes such as incorporating large plastic bags directly into RDF bales rather than re-shredding. These modifications have been regulated through the Management of Change process. ***Energy balance record*** The following are undertaken on site: a. Energy consumption is determined from weekly meter readings. Results are recorded on the Meter Readings spreadsheet. b. Energy generated is taken from burning methane from the anaerobic digestion process. The volumes of burnt gas is tracked on SCADA. The energy exported is determined from weekly meter readings and results are recorded on the Meter Readings spreadsheet. c. Energy flow information is held on the SCADA system. The Brookhurst Wood MBT facility is therefore fully compliant with this part of the BAT requirement.	Part 3, Management and Technical Plan, Section 5
BAT 24	Reuse of Packaging	Most packaging received on site is not of a quality that enables us to reuse it. However, items such as intermediate bulk containers are returned to the chemical supplier for reuse. Some pallets are used for storage or for returning large items to suppliers or to maintenance contractors.	-
BAT 25 NHIWAM 6.2	In order to reduce emissions to air of dust, and of particulate-bound metals, PCDD/F and dioxin-like PCBs, BAT from mechanical treatment is to apply BAT 14d and to use one or a combination of the techniques given.	N/A -not accepting metal waste	-

BAT Reference	BAT Description	Response	Application Reference
BAT 26 - 28	These criteria deal with mechanical treatment in shredders of metal waste.	N/A -not accepting metal waste	-
BAT 29 - 30	These criteria deal with mechanical treatment of WEEE containing VFCs and/or VHCs	N/A – not accepting WEEE	-
BAT 31	These criteria deal with mechanical treatment of waste with a calorific value	Exhaust air from the Process and Dryer buildings, along with air extract from some tanks. is passed through a dust filter and bio-reactor before being discharged to air, mixed with the exhaust air from the CHP engines, via the main chimney. The techniques were previously assessed as BAT at the time of the MBT permit application and as no changes to these arrangements are proposed as part of this application, they are considered to still meet the requirements of BAT 31.	Part 3, Management and Technical Plan, Section 5
BAT 32	These criteria deal with the mechanical treatment of WEEE containing mercury	N/A – not accepting WEEE	-
BAT 33	In order to reduce odour emissions from biological treatment of waste and to improve the overall environmental performance, BAT is to select the waste input.	The overall waste inputs are defined as domestic and non-hazardous as is set out in the terms of a contract with West Sussex County Council (WSCC) for the MBT site and, as such, does not vary greatly. The site only accepts waste from WSCC sources, having been constructed as part of a municipal contract for WSCC, who will retain ownership of the site at the end of the contract term. WSCC perform a waste composition analysis every few years to ascertain whether there have been any significant changes. The site has a formally agreed set of Incoming Waste Acceptance Parameters (IWAP) which are formally set out in the contract at Section 2.0, and an extract from the contract of section 2 (IWAP Criteria). The most recent waste composition analysis undertaken by WSCC. See also section 3.4.1 of the Site Management Plan. Although the site can also accept third party wastes, they must be the same as under the IWAP, although to date no third party wastes have ever been accepted. Organic wastes for treatment in the anaerobic digestion facility are segregated from the above inputs. The entire facility was constructed with one of the purposes in mind being to segregate organic waste from non-source segregated household wastes and to treat the organic waste in the anaerobic digestion process as per the Process Operating Manual, section 4. The site is not designed to accept hazardous or dangerous waste types (which might affect biological activity in the anaerobic digestion stage), and wastes will be in accordance with the Incoming Waste Acceptance Parameters. Procedure WS002, put together to support the EMS for the facility, deals with waste pre-acceptance at sections 1 and 2. See also section 3.4.1 of the Site Management Plan. Procedure WS002 also deals with waste acceptance. Incoming waste is visually assessed by Crane Operators and MSOs to ensure that characteristic parameters are met. Weighbridge Operators ensure that documentation correct and that the listed material conforms to acceptable waste types. The waste arises from domestic sources and do not comprise hazardous wastes and due to its nature is not subject to analysis beyond the characterization described above in the IWAP. Waste should all be non-hazardous and confirm with the IWAP specification. However, should non-conforming waste come on to site, this will be rejected, form WS171 (Load non-conformance report) completed and the load directed off-site. An output quality management system is fully in place. Again, please refer to the Site Management Plan, section 3.6 (Appendix 2). The facility also meets compliance with ABPR treatment requirements in relation to the treatment of organic wastes which are fed into the anaerobic digestion stage for biological treatment. The in-vessel stage of treatment is computer controlled via the SCADA system, with time and temperature requirements being regulated by the system to ensure these are fully met before a batch is released from the relevant processing stage. Outputs measured are recorded via the system and auditable. Final outputs from the AD process are also sampled in accordance with the HACCP plan, for various tests to comply with ABPR requirements. In order to ensure compliance of outputs of digestate from the AD process, key critical control points are monitored in accordance with an approval under ABPR in accordance with an agreed HACCP plan and noted procedures HACCP1 to HACCP 4. These comprise controls on time and temperature requirements within the process (which are achieved through the SCADA system) and also sampling and analysis of outputs at an external laboratory on a monthly basis. As above, the waste acceptance and sorting processes ensure that only organic wastes are fed into the anaerobic digestion stage, with the other materials that cannot be processed, or may influence biological activity, having been removed by the pre-treatment and wet pre-treatment stages.	Part 4, Odour Management Plan
BAT 34	In order to reduce channelled emissions to air of dust, organic compounds and odorous compounds, including H2S and NH3, BAT is to use one or a combination of the techniques.	In order to reduce channelled emissions to air of dust, organic compounds and odorous compounds a combination of techniques are used, comprising treatment of extracted air from buildings and process tanks, and treatment by both chemical and biological means. Extraction takes place from a number of areas: A misting system is firstly installed above each of the reception bunkers to suppress odour coming from waste in the bunkers. To prevent fugitive emissions air is then extracted from the waste reception hall, the mechanical pre-treatment area and the wet pre-treatment areas within the building. This is largely done via large steel ducts which draw in air through a series of grills, although highly odorous areas such as over screens and at the interchange of conveyor belts there are extraction hoods which are connected directly to the main extract ducts to provide localised extraction. In the wet pre-treatment area, sludge mixing tanks and settlement tanks are also connected directly to the extraction system to allow for air extraction form the head spaces. To prevent venting from tanks in the AD area, comprising the hydrolysis tank, process water tank, aeration tank, MBR tank, pasteurisation tanks and external liquid waste tank, exhaust air pipework from these tanks joins a common duct, and first passes through a chilled water scrubber before joining the air stream from the process building. The operation of the chilled water scrubber is monitored from the SCADA control system.	Part 4, Odour Management Plan

BAT Reference	BAT Description	Response	Application Reference
		The dryer building contains a hot air dryer which uses heat from the CHP engine exhaust to dry dewatered digestate. Odorous air is extracted from this building, as well as decanter and screw conveyor areas and the four digestate offloading bays in the dryer building which are fitted with exhaust hoods. Following extraction from the above areas, with the initial treatment of exhaust air above, the flows are then fed through the main treatment plant. The plant makes use of a caustic scrubber to absorb acid gases such as H2S from the exhaust air before it is polished on the biofilters and activated carbon filter and then discharged at the stack. There are 5 bioreactor vessels designed to treat odour in the exhaust air before discharge. Crucial elements of bioreactors are monitored via SCADA system. If pH, flow and temperature are all within working parameters the bioreactors should function correctly. Operating performance is again monitored via SCADA. When the carbon filter is in use, airflow from the inlet and outlet of the system is sampled and analysed for VOCs using a PID analyser, to monitor the effectiveness of the system in reducing VOCs at daily intervals. Section 4.8.3 of the Process Operating Manual. Ferric chloride is also used during the wet pre-treatment, hydrolysis and anaerobic digestion processes to manage hydrogen sulphide in exhaust air and biogas. Section 4.7 of the Process Operating Manual. The accepted plant design utilises air in the following processes: bioreactors, aeration tank and membrane bioreactor. Pure oxygen is not being used at this point. Scum layers are prevented by using mechanical agitation in the process tanks. Foam layer in aeration tank and Membrane Bioreactor (MBR) is controlled by using anti-foaming agents. Section 5.7.2 of the Process Operating Manual. Dissolved oxygen in MBR is monitored by the SCADA system and flow of air is regulated to maintain suitable oxygen concentration in the tank. With exhaust air being subject to treatment before discharge by a combination of wet scrubbers followed by biofiltration, the Brookhurst Wood MBT facility fully complies with the BAT requirements under this BAT conclusion for using a combination of techniques to reduce channelled emissions to air. • BAT-associated emission levels BAT-AELs that will be applied to the point source discharge from the biofilters. Monitoring will be implemented in accordance with BAT 8 – See section 3.1.8. A BAT-AEL of 20 mg/Nm3 will be applied to ammonia emissions and a limit of 1000 oug/Nm3 to odour concentration (where monitored as either ammonia or odour can be monitored to comply with BAT 8). In addition BAT-AELS of 5 mg/Nm3 will be applied to dust and 40 mg/Nm3 will be applied to total volatile organic carbon.	
BAT 35 In order to reduce the generation of wastewater and to reduce water usage, BAT is to use all of the techniques given below: a. Segregation of water streams b. Water recirculation c. Minimization of the generation of leachate		***Segregation of Waste Streams*** The site has been designed to segregate all clean surface water run-off from process effluent or contaminated drainage arising from wastes stored on site. Only clean surface water is discharged to the receiving water. The Brookhurst Wood MBT plant is operated in accordance with the Site Management Plan, and the Process Operating Manual. The Biffa West Sussex Emergency Response Plan – document WS073, also contains a suite of drawings at sections 3, 4a and 4b. Section 3 (Site layout) shows the site layout and location of main process areas and key AD plant. Section 4a (Drainage Plan General Arrangement) shows the drainage arrangement for the whole facility, and section 4b (Site Drainage Plan – Schematic of surface water drainage) gives further detail on the control of drainage flows. In accordance with the requirements of the Site Management Plan, section 4.3, the waste processing building (which includes waste reception/storage areas and the MBT process area and AD wet pre-treatment process area) is provided with impermeable pavement and engineered drainage systems to prevent a discharge to sensitive receptors. The floor of the process area directs water to an SBR/MBR treatment tank (these details also being shown on the Site Drainage Plan at section 4b of the document WS073. The MBR treatment tank is located externally within a bunded contained area the tanks having leak detection and high level alarms to avoid risk of overflowing. The MBR pre-treats contaminated drainage before discharge to foul sewer under consent from Southern Water. Storage tanks for fuel and chemicals used in the treatment process have similar provisions and are also within an engineered containment bund. Secondary containment provided for all fuel and chemical storage tanks is constructed in accordance with the relevant CIRIA standards. The process tanks associated with the AD plant are similarly located in an external bunded area with no direct connection to the drainage systems. The area is either pumped to the hydrolysis tank to be used as process water if contaminated, or to surface water via the lagoon if clean. Drainage drawings at sections 4a and 4b of document WS073 show the location of the various areas, bunding and drainage arrangements, including normal status of valves on outfalls from areas and method of operation to ensure that sensitive receptors/watercourses are not impacted by site operations. Containers used for storage of fuel or chemicals necessary for the waste treatment or abatement systems are stored in suitable tanks within an engineered containment bund. Leak detection and high level alarms are provided. Secondary containment provided for all fuel and chemical storage tanks is constructed in accordance with the relevant CIRIA standards. Clean surface water from roof areas and from external non-waste storage/non-waste processing areas drains to a site lagoon via an oil separator, from where it is discharged to surface water. In the event of a fire on site the lagoon discharge can be isolated via a Penstock valve. ***Water recirculation*** Drainage collected in the respective parts of the facility is re-used as appropriate. Process water is recirculated in the wet pre-treatment stage. Surface water/rainwater is captured and also fed into the wet pre-treatment stage, rather than being discharged from the site to surface water courses. Refer to the Process Operating Manual section 5.14.2.2. This reduces demand on potable mains water supplies. ***Minimising of the generation of leachate***	Part 3, Management and Technical Plan, Section 5

BAT Reference	BAT Description	Response	Application Reference
		Wastes received at the site are stored and treated indoors which minimises excess generation of leachate. The AD process requires addition of water, although rainwater is harvested for use as process water as well as any drainage accumulating with the waste reception pits/bunkers or process tank bunds.	
BAT 36	In order to reduce emissions to air and to improve the overall environmental performance, BAT is to monitor and/or control the key waste and process parameters.	N/A – not aerobic process.	-
BAT 37	In order to reduce diffuse emissions to air of dust, odour and bioaerosols from open-air treatment steps, BAT is to use one or both of the techniques given below. a. Use of semi-permeable membrane covers Adaption of operations to meteorological conditions	N/A – not an aerobic process.	-
BAT 38	Criteria for anaerobic treatment of waste	A number of systems are in place to monitor and control, via a combination of automated processes or manual sampling and monitoring, the following key process areas: ***Stable digester operations*** Parameters as per the design specifications (pH, temperature, loading rates, pressure, etc) as set out in Section 4.4.5 of the Process Operating Manual, for the digester system are constantly monitored via the SCADA system. The materials/gases in this process, as well as process conditions, are tested regularly by the internal laboratory. In addition, to ensure compliance with ABPR regulations samples are sent to an external laboratory. ***Minimize operational difficulties, such as foaming, which may lead to odour emissions*** The plant is maintained as per a schedule on the Computerised Maintenance Management System (CMMS). Also, any issues observed by staff are logged on to the Near Miss Hazard Tracker and dealt with appropriately. This allows the plant to run smoothly. The process conditions are monitored constantly to avoid foaming events within digesters. Gas peaks are monitored via SCADA and dealt with as they arise according to the Process Operating Manual. ***Provide sufficient early warning of system failures which may lead to a loss of containment and failures*** Digester tanks are equipped with sensors that are monitored by the SCADA system. Optimum levels are set within SCADA which will then set off an alarm should a sensor reading go beyond these levels. Appropriate action is then taken. The digesters are also equipped with level switches that will stop all pumps filling the tanks if safe levels are breached. All digesters are also equipped with pressure and vacuum relief valves to protect the tank from catastrophic failure. Refer to the Process Operating Manual.	Part 3, Management and Technical Plan, Section 3.6
BAT 39	Criteria for mechanical biological treatment (MBT) of waste	***Segregation of gas waste streams*** Air taken from the process buildings and process tanks is treated via the Odour Abatement System as described in the Odour Management Plan – Fig 2.1. The plant also generates biogas for use as fuel. Section 4.7 Biogas System of the Process Operating Manual describes fully how gas from the relevant tanks is managed. ***Recirculation of waste gas*** The plant is designed to either burn gas generated by the anaerobic digestion process, or to treat odorous air from the process tanks and buildings through the odour abatement system which is then expelled to atmosphere.	Part 3, Management and Technical Plan, Section 3.6 Part 4, Odour Management Plan
BAT 40 NHIWAM 5	Improve overall environmental performance physico-chemical treatment of solid and/or pasty waste by monitoring the waste input as part of the pre-acceptance and acceptance procedures.	The existing MBT processes have been previously assessed as BAT at the time of permit issue. As no changes are proposed to these techniques, they are felt to continue to represent BAT and include: a. The site has waste characterization and pre-acceptance procedures which meet the requirements of NHIWAM section 3.1 and BAT2 as detailed in the Management and Technical Plan. b. The site has waste acceptance procedures which meet the requirements of NHIWAM section 3.2 where those measures are relevant and suitable, and BAT2 as detailed in the Management and Technical Plan. c. Biffa utilizes a computerised information management system to track incoming waste which meets the requirements of NHIWAM section 3.4. d. Biffa operates a quality management system (QMS) for outputs in accordance with relevant Quality Protocols, contract specifications and other standard requirements. The QMS is certified to BS EN ISO 9001 standard. e. Following visual assessment on arrival at the MBT facility, waste for treatment is taken directly to the MBT waste reception area, or in some cases directly to quarantine – this will be confirmed through the site waste acceptance procedure described in section 3.4 of the Management and Technical Plan which includes visual inspection on arrival, waste sampling and subsequent testing. f. There are no pre-treatment activities associated with the MBT or the new waste transfer and storage area. Incoming waste will be processed through the mechanical treatment stage with residual organics passing to the AD plant, with food waste passing directly to the AD plant. g. In relation to waste storage, and waste handling, operations are detailed in the Management Plan. This will include visual inspection of the material and removal of unwanted material . h. Wastes with potentially incompatible characteristics – this will be confirmed using the information collected during pre-acceptance and acceptance checks.	Part 3, Management and Technical Plan, Section 3.4
BAT 41 NHIWAM 6	Reduce emissions of dust, organic compounds and NH_3 to air using one of a combination of techniques given below:	The existing MBT processes have been previously assessed as BAT at the time of permit issue. As no changes are proposed to these techniques, they are felt to continue to represent BAT. Details are provided in the Management and Technical Plan, Odour Management Plan and Dust Emissions Management Plan and include management of exhaust air from the Process and Dryer buildings, along with air extract from some tanks being passed through a dust filter	Part 8, Impact Assessment Report Part 3, Management Plan, Section 4

BAT Reference	BAT Description	Response	Application Reference
	a. Adsorption b. Biofilter c. Fabric filter d. Wet scrubbing	and bio-reactor before being discharged to air, mixed with the exhaust air from the CHP engines, via the main chimney. Control of emission is therefore based on: • Dust filter and acid scrubber for exhaust air from process/dryer building and some tank extraction; • Combustion control for gas engines, flare and back-up generator and boiler.	Part 5, Odour Management Plan Part 6, Dust Management Plan
BAT 42 - 44	Criteria for re-fining of waste oil	N/A -not undertaking waste oil re-fining	-
BAT 45	Criteria for physico-chemical treatment of waste with calorific value	Exhaust air from the Process and Dryer buildings, along with air extract from some tanks is passed through a dust filter and bio-reactor before being discharged to air, mixed with the exhaust air from the CHP engines, via the main chimney. The techniques were previously assessed as BAT at the time of the MBT permit application and as no changes to these arrangements are proposed as part of this application, they are considered to still meet the requirements of BAT 45.	Part 3, Management and Technical Plan, Section 5
BAT 46 - 47	Criteria for the regeneration of spent solvents	N/A -not undertaking regeneration of spent solvents	-
BAT 48 - 49	Criteria for the thermal treatment of spent activated carbon, waste catalysts and excavated contaminated soil	N/A -not undertaking thermal treatment as defined by BAT (e.g. using furnace) of any waste types	-
BAT 50 NHIWAM 6.2	In order to reduce emissions of dust and organic compounds to air from the storage, handling and washing steps, BAT is to apply BAT 14 d and to use one of a combination or Techniques given below. • Adsorption • Fabric filter Wet scrubbing	N/A – not undertaking washing of contaminated excavated soil	-
BAT 51	Criteria for decontamination of equipment containing PCBs	N/A -not undertaking decontamination of equipment	-
BAT 52 - 53	Criteria for treatment of water-based liquid waste	N/A -not accepting or treating any water-based liquid waste	-
Section 6.1 NHIWAM 6.1	Techniques for Controlling Channelled emissions to air	The existing MBT processes have been previously assessed as BAT at the time of permit issue. As no changes are proposed to these techniques, they are felt to continue to represent BAT. Details are provided in the Management and Technical Plan, Odour Management Plan and Dust Emissions Management Plan and include management of exhaust air from the Process and Dryer buildings, along with air extract from some tanks being passed through a dust filter and bio-reactor before being discharged to air, mixed with the exhaust air from the CHP engines, via the main chimney. Control of emission is therefore based on: • Dust filter and acid scrubber for exhaust air from process/dryer building and some tank extraction; • Combustion control for gas engines, flare and back-up generator and boiler.	Part 3, Management and Technical Plan, Section 5
Section 6.2 NHIWAM 6.2	Techniques for diffuse emissions of organic compounds to air	N/A – not accepting waste which will generate VOCs	-
Section 6.3 NHIWAM 6.4	Techniques for controlling emissions to water	Details of the wastewater management arrangements for the MBT site and waste transfer and storage area are provided in section 5 of the Management and Technical Plan. This sections confirms that: • Water is recirculated from the process, from the CLO drainage system and where necessary from the surface water management system by treating in an SBR process to achieve the quality required for reuse; • The MBT and associated waste transfer and storage area is constructed with an impermeable surface in waste storage and treatment areas with falls to collection drains which facilitate potentially contaminated water being directed through the SBR treatment plant prior to recirculation in process; • Tanks and vessels within the MBT/AD installation boundary are proprietary design, situated on impermeable surface, with level monitoring and alarms and containment equivalent to 110% tanks volume or 25% of the total capacity of the system storage capacity, whichever is greatest; • The drainage system is structured such that clean surface run off is kept separate from potentially contaminated run off - clean run-off will drain to the MBT surface water lagoons prior to discharge when needed to Boldings Brook. • Site mobile and processing plant will be subject to daily visual inspection and planned preventative maintenance which will minimize the risk of leaks; and All potentially contaminated water will be treated and any which cannot be recirculated for use in the MBT process will be discharged via foul sewer.	Part 3, Management and Technical Plan, Section 5
Section 6.5 NHIWAM 2.3., 2.4 & 9	Techniques identified are: a. Accident management plan Residues management plan	Details of the site accident management arrangements are provided in the Management Plan. These arrangements include appropriate: • Protection measures such a site security, CCTV, segregation of waste, fire prevention and access to appropriate equipment in the event of an incident; • Details of the site emergency procedures including contingency arrangements which ensure site storage capacities are not exceeded; and	Part 3, Management Plan, Sections 3 and 5.2. Part 8, Impact Assessment Report

BAT Reference	BAT Description	Response	Application Reference
		• Details of the procedures to investigate and record such incidents, accidents and non-conformances. Staff will be trained in site emergency procedures which are tested through drills to evaluate the effectiveness. Abnormal operations associated with the including those which can give rise to accidental releases and emergency situations have been assessed within the Impact Assessment Report. Arrangements with respect to residue management are detailed in the Management and Technical Plan, Section 3.66.	