WASTE TREATMENT AND PACKAGING FACILITY, ST MICHAELS CLOSE

Elliot Environmental Drainage Limited

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CONTENTS

1 Introduction

1.1 This document includes an assessment of Best Available Techniques (BAT), which has been undertaken against the relevant BAT measures contained within the following document:

- Commission Implementing Decision (EU) 2018/1147 of 10 August 2018 Establishing Best Available Techniques (BAT) Conclusions for Waste Treatment, Under Directive 2010/75/EU of the European Parliament and of the Council.[1]

1.2 This document has been prepared as part of the permit application for the proposed operation of a waste treatment and packaging facility at St Michaels Close, Aylesford, Kent. Throughout this document, reference has been made to other application documents, where relevant, which should be read in conjunction with this document.

1.3 The application includes installation activities listed under Schedule 1 Part 2 Section 5.3 Part A(1)(a)(ii) and (iv) and Section 5.6 Part A(1)(a) of The Environmental Permitting (England and Wales) Regulations 2016, for the physico-chemical treatment of hazardous and non-hazardous waste, repackaging of hazardous and non-hazardous waste and temporary storage of hazardous waste. As such, the operations are required to comply with the BAT conclusions outlined within Commission Implementing Decision 2018/1147.

[1] Commission Implementing Decision (EU) 2018/1147 of 10 August 2018 Establishing Best Available Techniques (BAT) Conclusions for Waste Treatment, Under Directive 2010/75/EU of the European Parliament and of the Council.

2 BAT Assessment

2.1 Assessment of BAT Against Commission Implementing Decision (EU) 2018/1147

2.1.1 Overview

2.1.1.1 The following sections provide assessment of BAT compliance for the proposed plant against the BAT Conclusions Document.

2.1.2 BAT 1 – Environmental Management System

2.1.2.1 An Environmental Management System (EMS) has been prepared for the operation, which has been submitted with this permit application, demonstrating compliance with BAT 1.

2.1.3 BAT 2 – Improvement of Overall Performance of Plant

2.1.3.1 BAT 2 confirms that in order to to improve the overall environmental performance of the plant, BAT is to use all of the techniques itemised within the associated table. These are considered in turn within the following sections.

BAT2a - Waste Pre-Acceptance and Characterisation for Routine Loads

2.1.3.2 All available information in respect of each waste stream including any chemical analysis (as applicable) will be reviewed in order to verify that waste is coded correctly as part of pre-acceptance procedures.

2.1.3.3 Waste assessment comprising stringent pre-acceptance checks will be carried out on all routine loads upon collection and prior to them entering the site. This will include, but is not limited to, visual and olfactory checks of the load for any signs of contamination and/or non-conforming materials. If during the inspection there is evidence of visual or olfactory contamination that renders the load unsuitable for processing, the material may be rejected. The customer may also be informed to dispose/recover the material at an alternative suitably licensed facility.

2.1.3.4 Prior to acceptance, all loads will be reviewed and booked in on the electronic system or spreadsheet maintained by the Site Operator to ensure that the company is aware of the load composition and obtain details of the load i.e. physical properties and assigned European Waste Catalogue (EWC) code.

2.1.3.5 Prior to receipt of waste at the site, the source of the waste will be required to provided, including the following:

- the waste producer (i.e. site name address and contact details);
- the source and nature of the waste, at the point of production;
- a description of the waste including its physical form;
- the full characteristics of the waste including the variability and reactivity (if relevant);
- a description of any odour potential;
- the type of packaging and risks of contamination;
- an estimate of the quantity; and,
- the age of the waste.

2.1.3.6 Pre-acceptance documentation will be retained for a period of 3 years following receipt of a load. The potential odours and emission risks will be reviewed and considered prior to acceptance to ensure that suitable handling and storage procedures are implemented at the site.

2.1.3.7 Upon first collection of a new waste stream, a sample will be taken and sent off for testing.

2.1.3.8 An initial 12-month evaluation will be carried out by the operator to determine the composition of waste streams. The characterisation will ensure sampling is undertaken in accordance with a testing regime.

2.1.3.9 The characterisation period will include samples of the loads to ensure the acceptable receipt at the site. The proposed regime will involve testing (but not limited to) the following:

- hazardous substances;
- heavy metals and toxic elements;
- TPH;
- organic matter;
- moisture content;
- protein;
- carbohydrates;
- total solids;
- volatile fatty acids;
- ammonia;
- pH and alkalinity;
- nitrogen; and,
- methane.

2.1.3.10 Specific, relevant limits will be set for each of the above parameters, in the event that any of the limits are exceeded during sampling and testing, the load will receive a negative result and the load will be temporarily ceased and may be rejected.

2.1.3.11 All samples will be tested in a laboratory using suitably recognised test methods. Following the initial waste characterisation period, routine loads will be subject to testing on a quarterly basis. If results of testing are consistent for a period of 6 months, the site will reduce testing to every 6 months which will remain the testing regime going forward. In the unlikely event that material is tested with results showing levels above the set thresholds, the operator will revert to quarterly testing.

2.1.3.12 The above provides demonstration of compliance with BAT 2a.

BAT 2b - Waste Acceptance Procedures for Routine Loads

2.1.3.13 Loads will also be inspected upon entering the site using the same visual and olfactory checks as discussed within the previous section. Upon arrival at the site, all incoming vehicles are required to report to the person in charge of waste acceptance at the site.

2.1.3.14 The details of the load will be recorded and the duty of care note/company documentation will be further checked by the operator to ensure that the load is acceptable at the site, including a visual check prior to the vehicle proceeding to the tipping area. Any deviation from the procedures or problems with any loads will result in tipping facilities being suspended for the offending company. Loads which are not acceptable within the above terms will be rejected.

2.1.3.15 It can sometimes be difficult to inspect a load prior to tipping and therefore, in addition material will be inspected during unloading activities so that any non-conforming materials may be identified, removed and transferred into the rejected waste container and recorded on the rejected waste form. Evidence of all waste assessment (in line with WM3) will be documented and be accompanied with the relevant duty of care note/company documentation.

2.1.3.16 Any waste arising from the waste producer/contractor will be assessed and classified in accordance with the guidance set out in WM3. The operator will require confirmation of the WM3 assessment and be provided with the accompanying waste transfer note or Hazardous Waste Consignment Note (HWCN) describing the physical and chemical composition, hazard characteristics and handling precautions, compatibility issues and information to specify the original waste producer and process.

2.1.3.17 The characterisation period detailed in the section above will help the site identify the composition of waste to inform the risk basis for the waste acceptance criteria and ongoing receipt, this may consider the following:

- the source and nature of waste;
- hazardous properties within the waste;
- potential risks associated with the waste i.e. odour and other relevant emissions; and,
- knowledge of the waste producer and age of the waste.

2.1.3.18 All deliveries in bulk tankers will be accompanied by a “wash out” certificate, as applicable.

2.1.3.19 If there is visual or olfactory evidence that wastes have been mis-classified as non-hazardous or mis-coded by the waste producer, the waste will be quarantined in a sealed area pending further testing to ensure suitability with the treatment plant or removal from site to a suitably authorised facility for further recovery/disposal.

2.1.3.20 Notwithstanding the above, if a load of incoming waste is found to have substance concentrations which do not cause the waste to be classified as hazardous under WM3 but nevertheless are sufficiently close to the limit values, that waste may be classified as hazardous, to ensure the operator can process the load through the relevant part of the treatment plant.

2.1.3.21 It is important to note that the treatment plant is designed to ensure all loads can be recirculated within the plant to allow for further processing. Residual, cleaned effluent will be periodically tested to ensure that the limits within the relevant Trade Effluent Consent are being met. In the event that material is not suitable for recirculation through the plant/discharge to sewer, it will be tankered off site and disposed of at a suitably licensed facility and relevant records retained by the operator.

2.1.3.22 In the event that a negative test result is received for contracted waste, the frequency of testing will be increased to monthly for a period of 6 months until the load has consistent positive results. The details and results of all testing will be recorded on an electronic spreadsheet by the operator.

Rejection Procedure

2.1.3.23 A waste may be non-conforming and rejected from the site for any of the following reasons:

- Delivery vehicle is unsuitable for site operations / conditions;
- The waste types are not acceptable at the site under the Environmental Permit;
- There is prohibited waste mixed within the load;
- The load is not accompanied by the correct documentation;
- The waste does not match the description on the accompanying documentation; and, or,

- The waste is unsuitable for treatment.

2.1.3.24 If waste is identified as being unacceptable upon collection, at the site entrance or at the point of offloading, the site manager will be contacted and a Waste Rejection Form issued. The driver of the load will be informed of the load's rejection, reason for the rejection and requested to leave the site.

2.1.3.25 Clearly labelled enclosed skips/containers will be provided for the deposit of rejected waste which cannot be removed from the site immediately. The location may be varied as operating conditions permit (i.e. to permit the loading of rejected wastes) but clear labelling and management control will ensure its use as specified.

2.1.3.26 If arrangements for the customer to remove the waste cannot be made, the Operator will make these arrangements. Waste materials in the quarantine area will be exported off site by a suitably licenced waste carrier to an appropriately permitted facility.

2.1.3.27 The above provides demonstration of compliance with BAT 2b.

BAT 2c - Waste Tracking Procedures

2.1.3.28 A Waste Tracking system will be maintained on-site. This will include the following information within an electronic recording system:

- Location and quantity of waste in the plant at any one time, including storage and undergoing treatment and details of relevant hazards;
- All records of Waste Pre-Acceptance and Pre-Acceptance, including analysis data, intended treatment route and hazards;
- Dates that waste has been accepted on-site, reference numbers and previous waste holders; and,
- Details of wastes exported from site.

2.1.3.29 The above will ensure that the operator has a clearly auditable trail of all wastes imported, stored, treated and exported from site.

2.1.3.30 The above provides demonstration of compliance with BAT 2c.

BAT 2d – Output Quality Management System

2.1.3.31 The operator will implement an output quality system on-site for outputs produced by the water. Outputs will include residual solid waste and cleaned water based liquid wastes. The goal of the proposed treatment is to clean water based liquid wastes to the extent that they can either be discharged to sewer, in line with limits within the Trade Effluent Consent in place for the site or be treated to an extent whereby they can be re-used on site in the process.

2.1.3.32 Information on routine incoming waste streams composition will be obtained as part of waste Pre-Acceptance and Waste Acceptance procedures and testing will be undertaken at multiple points within the process to inform on composition and effectiveness of treatment operations on-site. Records and inventories will be maintained, which will enable the operator to manage the process efficiently and determine if residual water arising from the process has been cleaned to the required extent. Treated water will only be discharged to sewer if it has been cleaned to the required standard, to be confirmed via on-site testing.

BAT 2e – Ensuring Waste Segregation

2.1.3.33 It will be ensured that non-compatible wastes will not be stored/treated together as the system will be flushed through between treatment campaigns. Hazardous and non-hazardous wastes will be stored separately in dedicated, marked tanks and will also be treated separately. The operator will remain continual records and site inventory, ensuring that it is always known the types and quantities of wastes which are on-site and their location within the process, including any hazards they pose.

BAT 2f – Ensuring Waste Compatibility Prior to Mixing or Blending

2.1.3.34 Above outlined above, it will be ensured that non-compatible wastes will not be stored/treated together as the system will be flushed through between treatment campaigns. Hazardous and non-hazardous wastes will be stored and treated separately.

BAT 2g – Sorting Incoming Solid Waste

2.1.3.35 Wastes to be received for treatment will predominantly include water based liquid wastes. Residual solids will be removed and separated from the wastes and various stages of the process. This will include initial screening and separation of grits, rags and other solid inclusions. Finer particles will be removed in later stages of the treatment process, such as via the settlement and flocculation processes and centrifuge process. This will ensure that solids are separated from waste streams as far as is practicably possible using BAT.

2.1.3.36 The smaller quantity of wastes received on-site for repackaging will not be subject to treatment, with segregation of non-hazardous and hazardous as well as liquid and solid wastes. These wastes will not be subject to treatment, to be sent on for further recovery or disposal.

2.1.3.37 Considering the previous sections, it should be considered that the onsite processes ensure compliance with BAT 2 in its entirety.

2.1.4 BAT 3 – Reduction of Emissions to Water and Air

2.1.5 Overview

2.1.5.1 At this stage it is not possible to provide a definitive/precise list of pollutants and concentrations within wastes and associated wastewater and waste gas streams arising from the process. However, it is possible to provide a broad list of compounds which may be present in wastewater and waste gas streams based on the range of wastes to be accepted.

2.1.5.2 All routine loads of waste will be subject to detailed pre-acceptance procedures, including sampling, as detailed in the previous section and sampling/monitoring will be undertaken throughout the process. This will ensure that all routine loads of wastes received on site will be fully characterised and required treatment and level of treatment can be determined by the site operator.

2.1.5.3 It is expected that wastes received for treatment will be predominantly comprised of water, such as jetting sludges arising from and cleaning operations as well as wastes arising from interceptor maintenance. However, a core part of the operator's business will also be emergency response to spillages and to provide the capability to accept more concentrated wastewater streams.

Waste Characteristics of Wastes to be Treated within Buildings 1 and 2

2.1.5.4 The table overleaf outlines the expected characteristics of wastes to be received for treatment, including anticipated range of compounds that will make up the waste. It should be noted that wastes to be accepted for treatment will comprise predominantly water based wastes with relatively minor levels of contaminants and not highly concentrated effluents.

Table 2.1 – Expected Waste Characteristics for Wastes to be Accepted for Treatment – to be Processed and Stored within Buildings 1 and 2 and External Storage Tanks

Component within Wastes	Compounds Expected
Water	Water – likely to be the predominant compound within wastes received for treatment
Oil (hydrocarbons)	Diesel range organics (C10 to C25)
	Mineral oils
	BTEX (benzene, toluene, ethylbenzene, xylene)
	Polycyclic Aromatic Hydrocarbons (PAHs) - naphthalene, phenanthrene, benzo(a)pyrene
Solids (clays, bricks, sands)	Clays/silicates
	Adsorbed metals
	Adsorbed hydrocarbons
Metals	Lead
	Zinc
	Copper
	Chromium
	Nickel
	Cadmium
	Mercury
	Arsenic
Organic matter (food/fats)	Fatty acid
	Alcohols
	Sugars
	Proteins
	Phenols
Nutrients	Ammonia
	Nitrates
	Nitrites
	Phosphates
Surfactants/detergents	Linear alkylbenzene sulphonates (LAS)
	Nonylphenol ethoxylates (NPEs)
	Quaternary ammonium compounds (QACs)
Dissolved salts	Chlorides
Cleaning/industrial effluents	Toluene
	Xylene
	Acetone
	Isopropanol

Component within Wastes	Compounds Expected
	Trichloroethene
	Dichloromethane
Microbiological contaminants	E. coli
	Enterococci
	Salmonella

2.1.5.5 The table below outlines the expected characteristics of waste gases arising from the treatment process.

Table 2.2 – Expected Waste Gas Characteristics

Component/Compound	Expected Concentration Range (Approximate)
Hydrogen Sulphide	5-500ppm (may be higher in more concentrated sludges)
Ammonia	10-100ppm
Volatile Organic Compounds	10-500mg.m^{-3}
Mercaptans/Thiols	1-50ppm
Aldehydes/ketones	1-50ppm
Sulphur dioxide	1-50ppm
Dust (bearing odourous compounds and metals)	Variable

2.1.5.6 Waste gases arising from the treatment processes and storage areas within Buildings 1 and 2 will be abated using a dust filter and activated carbon medium. These buildings will be maintained under negative pressure with exhaust air directed to the abatement plant. Storage tanks external to Building 1 will include carbon filters integrated within safety vents, controlling diffuse VOC emissions.

2.1.5.7 The control technologies to be used for control of wastewater emissions include the following:

- CDE HYDRO:TIP and CDE G:Max
- Clarification and Settlement Treatment Unit;

- Chemical Neutralisation Unit;
- Flocculation Unit;
- Dissolved Air Floatation (DAF) Unit;
- Centrifuge;
- Drum Screen and Collection Unit;
- Aerobic biological treatment;
- Carbon Filter(s); and,
- Sand Filter(s).

2.1.5.8 The following sections provide more details on the above treatment measures, how they function and the expected performance.

CDE HYDRO:TIP and CDE G:Max

2.1.5.9 Liquid wastes, road sweepings, grits and sludges which are to be subject to treatment will be delivered to site in sealed tanker lorries. These will be unloaded to the waste reception building (building 2), offloaded in a controlled manner to the Hydro Tip within Building 2. This will act to screen any larger material such as stones, which will be conveyed to a stockpile. The remaining sludges and liquids will be transferred to the CDE G-Max which will provide further screening of the material, separating liquids, sand, grits and organic matter. The resultant liquids will be pumped to dedicated non-hazardous and hazardous storage tanks, located externally to the building, which will store liquids prior to being processed further within Building 1.

Clarification and Settlement Treatment Unit

2.1.5.10 The clarification and settlement unit will act to remove suspended solids from the water using gravity, with a pre-treatment chemical dosing stage. A typical solids removal efficiency 70% or higher is anticipated using the Clarification and Settlement Unit.

Chemical Neutralisation Unit

2.1.5.11 The chemical neutralisation unit will act to adjust the pH of the wastewater stream to a neutral pH range, through dosing using alkaline and acid reagents, depending on the nature of the wastewater being treated. This unit will have a capacity of up to 1,000 litres per hour.

Flocculation Unit

2.1.5.12 The flocculation unit will provide a further line of solids removal from the wastewater, designed to remove remaining fine solids. The flocculation process will aggregate smaller particles into larger particles, which are then removed from the wastewater. This is achieved by the addition of a flocculant. Removal efficiencies will vary, dependent on the nature of the waste stream. However, removal efficiency of up to 90% may be expected for removal of suspended solids. This unit will have a capacity of up to 40m^3/hour.

DAF Unit

2.1.5.13 The DAF Unit will be used to separate fats, oils and grease from the wastewater. This involves the introduction of air bubbles into the wastewater, which attach to contaminants, including oil, causing them to rise (float) to the surface, enabling them to be separated from the waste stream. It would be expected that an oil removal efficiency of at least 90% would be achieved using the DAF Unit, but likely much higher than this of the process if operating efficiently.

Centrifuge

2.1.5.14 The centrifuge stage provides further separation of solids from liquids. The removal efficiency will depend on the nature of the liquid based waste and the size of particles, but a solids removal efficiency in excess of 90% would be expected.

Drum Screen and Collection Unit

2.1.5.15 The drum screen provides further removal of particles, including organic and inorganic solids.

Aerobic Biological Treatment

2.1.5.16 Aerobic Biological Treatment will include the addition of hydrocarbon degrading organisms to break down organic contaminants within the waste in the presence of oxygen.

Carbon Filters

2.1.5.17 Carbon filters are used as a final polishing step to remove remaining trace levels of organic compounds from the liquid wastes.

Sand Filters

2.1.5.18 Sand filters are also used as part of a final polishing stage to remove remaining suspended solids from the liquid wastes.

Waste Characteristics of Wastes to be Repackaged within Building 3

2.1.5.19 The table below outlines the expected characteristics of wastes to be repackaged within Building 3. It should be noted that these will not be subject to treatment, liquid wastes will be contained within sealed vessels. Solid wastes will be stored within enclosed vessels/containers and therefore will not pose a significant source of potential aerial or wastewater emission.

2.1.5.20 It should be observed, that whilst the area is referenced as a “repackaging area”, this area essentially acts as a bulking and storage area. No wastes will be mixed, decanted or transferred into additional containment within building 3.

2.1.5.21 The storage capacity within this area will be limited to a volume of $12m^3$.

Table 2.3 – Expected Waste Characteristics for Wastes to be Accepted for Repackaging within Building 3

EWC Codes	Components/Compounds Expected
05 01 05*, 13 07 01*, 13 07 02*, 13 07 02*, 13 07 03*, 15 01 01, 15 01 02, 15 01 03, 15 01 04, 15 01 05, 15 01 06, 15 01 07, 15 01 09, 16 01 14*, 16 10 01*, 16 10 03*, 16 07 08, 16 10 04, 17 08 01*, 17 08 02, 19 07 02*, 19 13 05*, 19 13 07*	Hydrocarbons Water Additives Metals Chlorides Sulphates Nitrates Organics Calcium Sulphate Plastics Wood Metals Glass

2.1.6 BAT 4 – Reducing Environmental Risk Associated with Storage of Waste

2.1.6.1 BAT 4 is to all of the techniques given in the table in order to reduce the environmental risk associated with the storage of waste. These are considered in turn within the following sections.

BAT 4a – Optimised Storage Location

2.1.6.2 The site design has been optimised to prevent any unnecessary handling and transport of wastes on site. Storage areas and processing areas are clearly defined on the Site Layout Plan. For example, wastes to be treated will be received within Building 1, with the liquid waste output directed a short distance to storage tanks and from the tanks will then be transferred into the adjacent building (Building 1).

BAT 4b – Adequate Storage Capacity

2.1.6.3 Maximum permitted storage quantities and duration of storage will be defined within the site management systems. Records of storage quantities will be assessed continuously against storage limits. Waste storage durations will be clearly defined within the site management systems and will be continuously monitored. The site operator will maintain an ongoing, electronic inventory and record of all wastes received and present on site, including quantities and storage locations. This will be continuously assessed against the limits of the permit and capacity of the site.

BAT 4c – Safe Storage Operations

2.1.6.4 Storage arrangements have been assessed as acceptable in terms of mitigating fire risk as part of the Fire Prevention Plan (FPP) submitted as part of this permit application. A plant and machinery inventory is maintained within the site EMS and procedures are documented in the EMS for safe storage of drums and vessels.

2.1.6.5 Drums and vessels will be constructed of suitable materials for the proposed contents, to prevent risk of corrosion or tank failure. Safety vents will be used on storage tanks to minimise risk of over pressurisation of storage vessels, both during storage and filling operations. A quarantine area will be maintained on site for rejected loads.

BAT 4d – Separate Area for Storage and handling of Packaged Hazardous Wastes

2.1.6.6 Hazardous wastes to be received for repackaging will be stored in a segregated area within Building 3.

2.1.7 BAT 5 – Reducing Environmental Risk Associated with Handling and Transfer of Waste

2.1.7.1 Wastes will only be handled and transferred by members of staff who are suitably trained/qualified. Appropriate training will be provided to all members of staff responsible for handling and transfer of wastes.

2.1.7.2 Any spillages of fuel/oil will be cleared immediately by depositing sand or absorbents on the affected area. The sand or absorbents will be placed in a skip to be taken to a suitably permitted site for disposal. All spillages of waste and windblown litter will be cleared by the end of the working day in which they occur. All site surfaces will be inspected daily when the site is in operation. Debris will be swept as required and placed in a skip for disposal to a suitably permitted site.

2.1.7.3 The site design also implements secondary containment to prevent pollution from leakage and spillage from the primary container. The proposed secondary containment is detailed within the supporting assessment, which considers relevant industry standards as detailed in CIRIA guidance C736 – Containment system for the prevention of pollution.

2.1.7.4 Once a load designated for treatment has been checked in on site, the tanker will manoeuvre and reverse up to the roller shutter door on Building 2, under supervision and instruction of site staff. Once the roller shutter door is opened, the tanker will reverse towards the pit, in readiness for the contents of then load to be unloaded to the pit. All manoeuvring on-site will be under the supervision of site staff.

2.1.7.5 The wash cycle to clear the pit out will take approximately 10 minutes to complete a full cycle, the hydro tip is equipment with a wash cycle including a hose at the top of plant which will use reclaimed treated water if needed from treated water tanks. This wash cycle will ensure that the CDE hydro tip has been washed top to bottom including sump using installed spray bars. This will wash through to the evo wash and continue to wash this plant.

2.1.7.6 There is no alternative storage on site for incoming loads prior to the introduction to the Hydro Max pit. All loads are pre-booked and therefore the operator will be able to schedule loads efficiently. In the event that the reception pit is not ready to receive an incoming load, the tanker driver will be instructed to wait until such time the load can be unloaded.

2.1.7.7 There is no alternative storage proposed, prior to introduction of wastes to the pit. Loads will be offloaded direct from HGVs to the pit.

2.1.7.8 It is confirmed that the Hydro Max pit is the only reception point for water based liquid wastes. The only other reception point for wastes on-site is within Building 3, which will receive waste to be repackaged and sent on for further recovery/disposal and not for treatment.

2.1.7.9 Solid wastes arising from the processing plant within Building 2 will be transferred to bays within Building 1 for temporary storage.

2.1.7.10 Drivers will reverse and be seen back by banksman, prior to offloading wastes to the tip within Building 2. The drivers will be required to vacate the cab of the HGV during offloading of waste to the pit and will only be permitted to re-enter the vehicle when tipping is completed, and all valves are closed.

2.1.7.11 The pit is located within a sealed area and wastes will not be released until the tanker is in position next to the pit, within Building 2. Should waste be spilled outside the area of the pit, this will drain to a large Aco drain in front of the hydro tip (Highest risk area). This will capture liquid, which will run into a pump chamber (alarmed) which will also pump liquids back into hydro tip. A spill procedure will be implemented and followed by the operator.

2.1.7.12 Wash out will be completed by staff trained by Elliot Environmental Drainage Limited and will be confirmed once driver/third party has accepted tank is clean to the appropriate standard. A wash out certificate will be issued to the driver.

2.1.7.13 Based on the above, the site is considered to operate in compliance with BAT 5.

2.1.8 BAT 6 and 7– Monitoring of Emissions to Water

2.1.8.1 There will be no direct discharges to surface water from the process. However, there will be indirect discharges, via the local Wastewater Treatment Works.

2.1.8.2 Monitoring of water based wastes will be undertaken at various points through the process. This will be undertaken at the point of discharge to sewer, to demonstrate compliance with limits within the Trade Effluent Consent, but also at other points within the process.

Proposed monitoring is outlined within the table below. Monitoring points are shown on the Site Layout Plan.

2.1.8.3 A Trade Effluent Consent has been issued for the discharge to sewer. This contains limits for various compounds. The H1 Risk Assessment for discharge to sewer has considered all compounds which the operator anticipates may be discharged. The concentrations assigned in the H1 Risk Assessment are based on BAT based limits and/or design criteria advised by the operator for the system.

Table 2.4 – Proposed Water Monitoring – Pollutants, Method and Frequency

Pollutant	Monitoring Frequency	Monitoring Method
Adsorbable organically bound halogens (AOX)	Once per day	EN ISO 9562
Benzene, toluene, ethylbenzene, xylene (BTEX)	Once per day	EN ISO 15680
Chemical oxygen demand (COD)	Once per day	No relevant EN standard
Free cyanide	Once per day	EN ISO 14403-1/2
Hydrocarbon oil index (HOI)	Once per day	EN ISO 9377-2
Arsenic	Once per month	EN ISO 11885, EN ISO 17294-2, or EN ISO 15586
Cadmium		
Chromium		
Copper		
Nickel		
Lead		
Zinc		
Manganese	Once per day	EN ISO 11885, EN ISO 17294-2, or EN ISO 15586
Hexavalent chromium (Cr(VI))	Once per day	EN ISO 10304-3 or EN ISO 23913
Mercury	Once per day	EN ISO 17852 or EN ISO 12846
PFOA and PFOS	Once every six months	No relevant EN standard
Phenol index	Once per day	EN ISO 14402
Total nitrogen	Once per day	EN 12260 or EN ISO 11905-1
Total organic carbon (TOC)	Once per day	EN 1484
Total phosphorous	Once per day	EN ISO 15681-1 and -2, EN ISO 6878 or EN ISO 11885
Total Suspended Solids	Once per day	EN 872

2.1.9 BAT 8 – Monitoring Emissions to Air

2.1.9.1 The table below outlines proposed emissions monitoring arrangements, in accordance with BAT.

Table 2.5 – Emission Limits and Monitoring Requirements – Emission Point A1

Pollutant	Emission Limits (mg.Nm^{-3}) Expressed at Reference Conditions of 273.15K, 101.3kPa, dry gas	Monitoring Frequency	Monitoring Method
Hydrogen Chloride (HCL)	5	Every six months	Manual extractive test - EN 1911 or EN 16429
Total Volatile Organic Compounds (TVOC)	20	Every six months	Manual extractive test - EN 12619 or EN ISO 13199

2.1.10 BAT 10 – Monitoring Odour Emissions

2.1.10.1 An Odour Management Plan (OMP) has been prepared for the operation which contains odour control and monitoring procedures, ensuring compliance with BAT 10.

2.1.10.2 Elliot Environmental Drainage Limited will use the following techniques to monitor odorous releases:

- Routine dynamic olfactory stack monitoring;
- Olfactory Monitoring (boundary Sniff Testing);
- Complaints Monitoring; and,
- Odour Diaries (when necessary).

Routine Dynamic Olfactory Monitoring

2.1.10.3 The Odour Control Unit (OCU) has been designed to efficiently destruct potential odourous compounds. There are no BAT based odour emission limits for the treatment of water based liquid wastes. However, the EU BAT Conclusions Document for Waste Treatment contains a BAT based odour limit for treatment of biological waste, of between 200 and 1,000 OU.m^{-3}.

It is anticipated that the upper end of this range will be achieved as a worst case residual odour concentration from the OCU.

2.1.10.4 Sampling using dynamic olfactometry according to EN 13725 will be undertaken every 3 months to establish residual odour concentrations arising from the stack serving the OCU and include assessment against the above criteria. Should all monitored odour concentrations be below 1,000OU.m^{-3} during the first 12 months of operations, monitoring would then be reduced to a period frequency of every 6 months.

2.1.10.5 Stack sampling will be undertaken to collect an air sample, in accordance with the EA Stack Emissions Monitoring Method Implementation Document for EN 13725. The stack has a sample port which has been designed in accordance with EA M1 Guidance. During each periodic test, bag samples of air will be collected from the stack and this subsequently exported from site for assessment of odour concentration in accordance with EN13725 and associated EA guidance. Stack sampling and post sampling assessment will be undertaken by a suitably accredited contractor.

2.1.10.6 In the event that the residual Odour Concentration exceeds 1,000 OU.m^{-3} from a routine periodic test, the operator will undertake immediate investigative action to identify the fault, take remedial action as necessary and then commission a further test to verify that the fault has been rectified.

2.1.10.7 Records of all sampling and any remedial action taken will be logged in the Site Diary and be available for inspection by the EA.

Olfactory Monitoring at Site Boundary (Sniff Testing)

2.1.10.8 In addition to the routine dynamic olfactory monitoring, odour will be monitored using sniff testing at the site boundary on a daily frequency and if there is a spillage of potentially odorous material, if an odour is detected on-site or in the event of odour complaint arising. During monitoring, the site supervisor, or designated, trained staff member, will monitor odour around the entire site perimeter and an Odour Diary will be completed.

2.1.10.9 The results of monitoring exercises and any remedial action taken will be entered into the log book which will be available for the EA to inspect upon request. The name of the site supervisor/odour assessor will be stated in the site's diary along with notes on weather including precipitation, temperature, wind speed and direction (from Met Office information).

2.1.10.10 Should the monitoring conclude that a certain activity/waste is giving rise to odour which is migrating offsite, steps will be taken to reduce the impact of this activity, which may include, but is not limited to; removal offsite to a suitably licensed facility, faster processing/lower storage rates, pumping and removal of standing surface water etc.

2.1.10.11 The site supervisor/odour assessor will be suitably trained to carry out these duties.

2.1.10.12 Prior to carrying out a routine odour check, the relevant member of staff will vacate the site for a period of 30 minutes and then carry out the assessment on their return to ensure they are not desensitised to the odour.

Complaints Monitoring Procedure

2.1.10.13 All odour complaints will be investigated promptly and appropriate remedial action will be taken if the complaint is validated. Complaints will be recorded.

2.1.10.14 Complaints to the EA will also be recorded and taken into account. An olfactory assessment survey will be carried out from where the complaint was made and from any convenient locations between the complainant/receptor and the site so that the complaint can be validated or rejected.

Odour Diaries

2.1.10.15 If members of the local community are frequently reporting odour issues in the vicinity, then they will be asked (if agreeable) to keep an odour diary. This will help to build up an account of when the odour occurs, their location and the site operations that were being carried out at the time, as well as the duration of the activities taking place. Any obvious problems can then be addressed.

2.1.11 BAT 11 – Monitoring Annual Consumption of Water, Energy, Raw Materials and Annual Generation of Residues and Waste Water

2.1.11.1 The site operator will maintain records of water, energy and raw material consumption, in addition to the monitoring of generation of residues and water on at least an annual basis.

2.1.12 BAT 12 and 13 – Reducing Odour Emissions

2.1.12.1 As per the recommendations of BAT 12, an OMP has been prepared for the operation which contains odour control and monitoring procedures.

2.1.12.2 BAT 13 confirms that BAT is to use one or a combination of relevant techniques identified within the document, however, not all of these would be applicable. Various treatment operations will be undertaken on site to reduce potential for odourous emissions, through abating contaminants within the waste streams.

2.1.12.3 Contaminants will be removed from liquid wastes using a series of treatment measures, including:

- Settlement and clarification to remove solid contaminants;
- Chemical neutralisation to adjust the pH of acidic and alkaline water based liquid waste streams, controlling odour;
- DAF Unit for oil water separation to remove oils;
- Flocculation unit for separation and removal of solid contaminants;
- Aerobic treatment, including the use of hydrocarbon degrading organisms;
- Centrifuge to remove solid contaminants; and,
- Use of carbon and sand filters as a final polishing stage.

2.1.12.4 All wastes to be treated will be unloaded, stored and treated within buildings maintained under negative pressure, with exhaust air directed to an OCU for control of residual odorous gases.

2.1.12.5 The storage tanks adjacent to Building 1 will be equipped with carbon filters integrated into safety vents, controlling diffuse emissions of organic compounds and associated odour.

2.1.12.6 BAT 13c is to reduce odour emissions through the optimising of aerobic treatment through methods such as:

- Use of pure oxygen
- Removal of scum
- Frequent maintenance of aeration systems

2.1.12.7 The facility incorporates a biological polishing stage with microorganisms added operating under aerobic conditions to support the degradation of residual contaminants (e.g. hydrocarbons). The process within Buildings 1 and 2 is designed to act as a contained, tank-based system with relatively short retention times (specified on supporting PFDs), which inherently limits the potential for anaerobic conditions and associated odour generation.

2.1.12.8 Pure oxygen is not required as the process is maintained using ambient air aeration, which is sufficient given the scale and function of this step of the wider process.

2.1.12.9 Due to the nature of the microorganisms added and the batch process nature of the treatment system significant scum formation is not expected.

2.1.12.10 The aeration system is subject to routine inspection and preventative maintenance (as per other BAT sections including 14f) to ensure effective processing and consistent aerobic conditions within the treatment tank.

2.1.13 BAT 14 – Reducing Diffuse Emissions, Particularly Including Dust, Organic Compounds and Odour

BAT 14a – Minimising the Number of Potential Diffuse Emission Sources

2.1.13.1 Diffuse emissions will be controlled as far as is practically possible on-site. The site has been designed to minimise unnecessary transfer material and transfer distances, therefore pipe run lengths are minimises as far as possible.

2.1.13.2 Gravity transfer will be use wherever possible. Initial loading of wastes to the reception pit within Building 2 will be via gravity transfer. Drop heights will be minimised throughout the process. A site speed limit of 15mph will be maintained for vehicles accessing the site.

BAT 14a – Selection and Use of High Integrity Equipment

2.1.13.3 All plant will be selected which is of high integrity and efficiency, which is in the interests of the operator. Equipment of lower integrity and quality would be more costly for the operator in the long run, since this would lead to the risk of more frequent repairs or need for replacement of plant and equipment.

BAT 14c – Corrosion Prevention

2.1.13.4 Tanks and pipework will be mild steel, stainless steel and High Density Polyethylene (HDPE) construction. All metal fixing mechanisms will be hot dipped galvanised to protect against corrosion. All external pipe work will be lagged and made from HDPE.

BAT 14d – Containment, Collection and Treatment of Diffuse Emissions

2.1.13.5 Sludges and liquid wastes requiring treatment will be delivered to site and unloaded to the enclosed reception area where they will be screened to remove grit and other solids. The resulting sludge/liquid will then be transferred via enclosed line to tanks for introduction to the process, which is contained within the building.

2.1.13.6 Buildings 1 and 2 will be maintained under negative pressure, with exhaust air extracted and diverted to filter and OCU with residual discharge via an elevated flue.

2.1.13.7 Hazardous and non-hazardous wastes which are received to be packaged for further recovery within Building 3 will be contained within sealed vessels/containers.

2.1.13.8 The storage tanks external to Building 1 will be equipped with carbon filters within pressure safety vents, meaning that diffuse VOC emissions will be controlled. The filters will be changed at regular intervals, and in line with manufacturer recommendation.

BAT 14e – Dampening

2.1.13.9 Given the nature of the feedstocks to be used, dust is not expected to be a significant issue as the site will predominantly process wet wastes, including sludges and liquids. However, wet cleaning methods will be used and site damping down undertaken if required to prevent potential fugitive emissions of dust.

BAT 14f – Maintenance

2.1.13.10 Regular maintenance will be undertaken on-site to ensure all plant and machinery is in good working order.

2.1.13.11 All plant and machinery used on-site will be maintained and serviced in accordance with manufacturer recommendation.

2.1.13.12 A policy of cleanliness will be maintained on site to ensure that waste treatment and storage areas , such as halls, traffic areas and storage areas, are kept clear.

2.1.13.13 Appropriate access will be maintained at all times to equipment which may have potential for leaks.

BAT 14g – Cleaning of Waste Treatment and Storage Areas

2.1.13.14 A policy of cleanliness will be maintained on site to ensure that waste treatment and storage areas , such as halls, traffic areas and storage areas, are kept clear.

2.1.13.15 Waste storage and treatment plant will be flushed through with water between treatment campaigns.

BAT 14h – Leak Detection and Repair Programme

2.1.13.16 The site will be subject to ongoing inspections by the operator, to ensure all plant and equipment is in good working order. This will include the following weekly visual inspections:

- Check tank bunds and ground for leaks and staining;
- Inspection of vents, seals, flanges and fittings for drips or corrosion;
- Verify that tank labels and signage are correct;
- Check for external signs of damage to tanks, vents, flanges and fittings (dents, cracks, bulging)

2.1.13.17 In addition to the above ongoing inspections, the operator will implement an annual Leak Detection and Repair Programme (LDAR), which will include a full site inspection by suitably qualified contractor to assess all pipework, fittings and tanks for leaks and any remedial action required, as applicable.

2.1.14 BAT 17 – Implement and Review a Noise Management Plan

2.1.14.1 An Environmental Noise Assessment and Noise Management Plan (NMP) has been submitted as part of this application. The NMP contains the following:

- An outline of relevant sensitive receptors;
- Identification of potential noise sources;
- A protocol containing appropriate actions and timelines – an outline of proposed mitigation based on identified noise sources and prediction of noise and vibration risk to receptors;

- A protocol for response to identified noise and vibration events, e.g. complaints; and,
- Training requirements relating to implementation of NMP.

2.1.14.2 The Noise Assessment submitted with the application has modelled potential noise impacts, demonstrating that potential noise as a result of site operations will be substantially below existing background levels. Therefore, it is not considered that routine noise monitoring will be required.

2.1.14.3 BAT 17 is therefore achieved through the ongoing enforcement of the NMP by site management.

2.1.15 BAT 18 – Reducing Noise and Vibration Emissions

2.1.15.1 BAT 18 is to utilise a combination of the specified techniques to reduce noise and vibration emissions. These techniques are discussed below.

BAT 18a - Appropriate Location of Equipment and Buildings

2.1.15.2 The proposals are making use of an existing buildings. The additional reception building and storage tanks are to be located in relative close proximity to the existing building, minimising lengths of material transfer and therefore the noise associated with this activity. The site is relatively limited in size and has been designed to accommodate the space in the most efficient manner.

BAT 18b – Operational Measures

2.1.15.3 The majority of operations will be enclosed within buildings on-site, provide substantial abatement of potential noise. Other control measures will be implemented, as outline in the following sections.

2.1.15.4 In order to reduce and control noise from HGVs travelling to and from site, the following measures will be used:

- Engines will be switched off when the vehicles are not being used;
- Waste deliveries and collections will only be permitted during the operational hours with no works on Sundays or Bank/Public Holidays. These hours are considered 'normal' working operational hours in an area dominated by industry;
- The existing access road to the operational area site will be maintained in good state of repair to prevent unnecessary noise being generated;
- Implementation of speed restriction on site;
- All drivers are required to enter and exit the site with due consideration for neighbours;
- Drop heights will be a maximum 1m from the ground to allow for clearance of the relevant vehicle;
- Management will ensure that all vehicles involved in the tipping of waste operated by Elliot Environmental Drainage Ltd are functioning suitably i.e., vehicles must be well maintained and operated with silencers and moving parts to be regularly lubricated;
- All mobile plant and other vehicles used will benefit from white noise reverse alarms; and,
- A no idling policy will be in place and staff/third party drivers will be told not to rev engines.

2.1.15.5 In order to reduce and control noise from manoeuvring of mobile plant around external areas of the site, the following control measures will be used:

- Management will ensure that all site vehicles operated by Elliot Environmental Drainage Ltd are functioning suitably i.e., vehicles must be well maintained and operated with silencers and moving parts to be regularly lubricated.
- All manoeuvring areas using mobile plant are surfaced with impermeable concrete which is generally flat and well maintained to prevent unnecessary banging of vehicles on uneven ground and preventing excessive vibration.

2.1.15.6 In order to prevent and reduce noise and vibration from small vehicles travelling to and from the site (e.g., staff and visitor's cars, courier van deliveries etc.), the following measures will be used:

- All those working on and visiting the site to be made aware of need for considerate driving and keeping vehicles well maintained;
- Small vehicles are not considered to be an issue in relation to excessive noise which could cause a complaint;
- Implementation of speed restriction on site; and,
- All drivers are required to enter and exit the site with due consideration for neighbours

2.1.15.7 In order to prevent and reduce noise and vibration from repairs on-site, the following measures will be used:

- If repairs to the site are required, the work is to be undertaken with due regard for the possible noise nuisance and during working day hours; and,
- In the event of major repair work being undertaken which is likely to cause significant noise and disruption, neighbouring residents and the Environment Agency will be notified in advance and these works would not commence without agreement unless in extenuating circumstances i.e., to minimise a fire or emergency occurring.

BAT 18c – Low-Noise Equipment

2.1.15.8 The Noise Impact Assessment has predicted resulting noise levels to be substantially below background levels at relevant receptor locations, based on the proposed site layout and design and therefore there is no requirement to consider noise equipment with lower noise ratings, although plant and machinery will be selected with efficiency a key consideration.

BAT 18d – Noise and Vibration Control Equipment

2.1.15.9 The majority of operations will be enclosed within buildings on-site, provide substantial abatement of potential noise.

BAT 18e – Noise Attenuation

2.1.15.10 BAT 18e is not applicable to new plants.

2.1.16 BAT 19 – Emissions to Water

BAT 19a – Water Management

2.1.16.1 Water use will be monitored and opportunities to reduce water use will be taken, if available and if practicably possible.

2.1.16.2 The operator proposes to treat and clean water to the extent that is can be re-used in the process, reducing new water consumption.

2.1.16.3 Only the minimum volume of water will be used in order to achieve the required outcome.

BAT 19b – Water Recirculation

2.1.16.4 The operator proposes to treat and clean water to the extent that is can be re-used in the process, reducing new water consumption. This will be subject to testing, to ensure the water is clean enough for such purpose.

BAT 19c – Impermeable Surface

2.1.16.5 Site storage and treatment areas will comprise impermeable surfaces.

BAT 19d – Techniques to Reduce the Likelihood and Impact of Overflows and Failures from Tanks and Vessels

2.1.16.6 The design incorporates Secondary Containment measures to control risk associated with tank failure. This has been verified as sufficient through completion of a CIRIA736 Assessment.

BAT 19e – Roofing of Waste Treatment and Storage Areas

2.1.16.7 Buildings 1, 2 and 3 provide covered/enclosed areas for storage and treatment of wastes. The storage tanks external to Building 1 will be appropriately bunded to contain tanks contents in the event of tank failure.

BAT 19f – Segregation of Water Streams

2.1.16.8 The site is served by separate clean and foul water sewers. Cleaned water arising from waste treatment process will be discharged to foul sewer in accordance with Trade Effluent Consent, or used in the process, subject to testing. Only uncontaminated water will be discharged to surface water sewer. Measures will be place to ensure foul and clean water is kept separate, as demonstrated by the Site Layout Plan.

BAT 19g – Adequate Drainage Infrastructure

2.1.16.9 The site is served by separate clean and foul water sewers. Cleaned water arising from waste treatment process will be discharged to foul sewer in accordance with Trade Effluent Consent, or used in the process, subject to testing. Only uncontaminated water will be discharged to surface water sewer. Measures will be in place to ensure foul and clean water is kept separate, as demonstrated by the Site Layout Plan.

BAT 19h – Design and Maintenance Provisions to Allow Detection and Repair of Leaks

2.1.16.10 New equipment such as pipework will be above ground as far as space and practicality considerations allow, to enable ease of inspection for leaks and repairs.

BAT 19i – Appropriate Buffer Storage Capacity

2.1.16.11 The process will be operated on a batch basis, and therefore the operator will be able to ensure that there is sufficient capacity within tanks, prior to liquid wastes being unloaded to the treatment process. Therefore, there is no feasible scenario whereby tanks on site would not have sufficient capacity for storage, taking account of risk of abnormal operation.

2.1.17 BAT 20 – Reducing Emissions to Water

2.1.17.1 The operator will use a series of preliminary and primary treatment, physico-chemical treatment and biological treatment measures to treat water based liquid wastes. This will include the following techniques, appropriate to the wastes being treated and ensuring compliance with BAT 20.

- Initial screening to remove coarser solids and grits, using CDE HYDRO:TIP and CDE G:Max;
- Clarification and Settlement Treatment Unit to separate and remove solids;
- Chemical Neutralisation Unit to neutralise acid and alkaline substances, also including metals;
- Flocculation Unit to separate and remove solids, including metals;
- Dissolved Air Floatation (DAF) Unit to remove fats, oils, greases and metals;
- Centrifuge to separate and remove solids, including metals;
- Drum Screen and Collection Unit to remove organic and inorganic solids;
- Aerobic biological treatment to remove hydrocarbons;
- Carbon Filter(s) to remove organic compounds; and,
- Sand Filter(s) to remove suspended solids, including metals.

2.1.18 BAT 21 – Preventing or Limiting Environmental Consequences of Accidents and Incidents

2.1.18.1 An Accident Management Plan (AMP) has been submitted as part of this application which covers procedures which will be implemented to prevent/limit environmental consequences of accidents and incidents, providing compliance with BAT 21. Accident control measures are summarised below.

2.1.18.2 Risk of fire will be controlled by the following measures:

- Site to be securely fenced and monitored 24-hours per day to prevent unauthorised access;
- Environmental Management System in place containing appropriate measures to reduce risk of fire during routine operation; and,
- FPP to be implemented during operations.

2.1.18.3 Risk of vandalism will be controlled by the following measures:

- Site to be securely fenced and monitored 24-hours per day to prevent unauthorised access;

2.1.18.4 Risk of equipment malfunction or breakdown will be controlled by the following measures:

- Planning Preventative maintenance schedules to be in place for all plant and machinery to be used; and
- Plant and equipment inspected regularly to ensure in good working order.

2.1.18.5 Risk of spillages of wastes/fuels will be controlled by the following measures:

- The site has procedures in place for fuel/oil storage on site are as follows:
  - The containers used for the storage of hazardous fluids will be surrounded by a bund capable of containing a minimum of 110% of the volume of fuel stored in the tank;
  - All pipework and associated infrastructure will be enclosed within the bund;
  - A lock will be fitted to the tank valve to prevent unauthorised operation;
  - Any storage of oil will comply with the Control of Pollution (Oil Storage) (England) Regulations 2001 SI No.2954 or any subsequent legislation;
  - All valves and gauges on the tank will be constructed to prevent damage caused by frost; and,
  - The tanks will be clearly marked showing their capacity and product contained.

2.1.18.6 Risk of flooding /abnormal weather such as heavy rainfall will be controlled by the following measures:

- Site has drainage system in place to manage clean and foul drainage.
- Site is located within Flood Zone 1 and therefore at lowest risk of flooding; and,
- In the event of heavy rainfall, fully treated water will not be discharged to the sewerage system to prevent surcharging of the foul sewer.

2.1.19 BAT 22 – Using Materials Efficiently

2.1.19.1 The operation will predominantly include the treatment of liquid based wastes and sludges. There will be requirement for use of raw materials and reagents as part of the treatment process. The use of raw materials will constantly be under review by the site operator and consideration will aways be given the use of materials with a lower environmental impact, if feasible. This will include consideration of waste substitutes for raw materials, should these be available. However, consideration must always be given to compatibility of waste substitutes with the material being treated, as the waste substitutes may be contaminated with other compounds other than the reagent of interest.

2.1.20 BAT 23 – Using Energy Efficiently

2.1.20.1 Energy use will be monitored regularly and the operator will review and record measures for improving energy efficiency on an annual basis and take any action deemed necessary by the review. A breakdown of energy consumption by type of source will be included as part of the review.

2.1.20.2 All mobile and stationary plant and equipment utilised at the site will be subject to regular maintenance to optimise operating efficiency. A record of fuel consumption will be maintained and will be used to identify any abnormal fuel consumption that requires investigation.

2.1.20.3 All staff will receive appropriate training for operations at the site which will include maintenance procedures and basic housekeeping (e.g. switching lights and equipment off when not in use). Low energy lighting systems will be used within the building.

2.1.20.4 Upon commencement of the operations, the operator will create an energy efficiency plan, outlining specific energy consumption of the activities on-site, with annual targets for energy consumption outlined. These targets will then be reviewed on an annual basis.

2.1.20.5 Furthermore, an energy balance record will be generated upon commencement of operations, providing a breakdown of energy consumption and generation by source, including the following:

- Information on energy consumption in terms of delivered energy;
- Information on energy exported from the installation; and,
- Energy flow information, showing how the energy is used throughout the process.

2.1.21 BAT 24 – Reducing Quantity of Waste Sent for Disposal

2.1.21.1 Wastes will be minimised as far as is practicably possible and disposed/recovered in accordance with the Waste Hierarchy. A full list of wastes and disposal/recovery route is included as part of this permit application.

2.1.22 BAT 33 – BAT Conclusions for the Biological Treatment of Waste – Reducing Odour Emissions and Improving Overall Environmental Performance

2.1.22.1 BAT 33 requires the implementation of waste pre-acceptance, acceptance and, where relevant, sorting procedures to ensure that incoming wastes are suitable for treatment, particularly in terms of characteristics that may affect biological activity and lead to odour generation.

2.1.22.2 The site accepts a wide range of liquid wastes of variable composition, primarily including those such as jetting sludges and interceptor wastes. The treatment process is not reliant on optimisation of a biological feedstock (unlike processes such as anaerobic digestion

facilities). Instead, the facility is designed to provide treatment across a broad spectrum of waste types.

2.1.22.3 Treatment is undertaken via a combination of processes, with the biological comprising a relatively minor stage of this wider process (to allow for degradation of residual hydrocarbons etc.) rather than acting as the primary treatment mechanism.

2.1.22.4 Based on the above, "selection of waste input" is considered to be achieved through robust waste pre-acceptance and acceptance procedures, as detailed previously under BAT 2 to ensure that incoming wastes are suitable for treatment and do not give rise to unacceptable environmental impacts (including odour) or would not impact the treatment process. This includes:

- Comprehensive pre-acceptance procedures, including detailed information gathering on waste origin, composition, variability, odour potential and associated risks.
- Verification and electronic booking and tracking to confirm waste coding and associated characteristics.
- Sampling and of waste streams, including ongoing verification testing to identify hazardous substances including those which may affect treatment efficiency or result in odour generation.
- Onsite acceptance checks, including visual and olfactory inspection of all incoming loads, with the capacity to reject, remove or quarantine non-conforming wastes.
- Segregation and staged treatment processes, including removal of solids and phased physico-chemical and biological treatment, to manage variability in waste composition.

2.1.22.5 The application of waste acceptance and initial waste screening procedures ensures that the treatment process operates effectively across the range of accepted wastes, thereby minimising the risk of odour emissions and ensuring compliance with BAT 33.

2.1.23 BAT 34 – BAT Conclusions for the Biological Treatment of Waste – Reducing Channelled Emissions to Air

2.1.23.1 The site will include a dust filter and carbon filtration to reduce channelled emissions to air, thus according with BAT.

2.1.24 BAT 35 – BAT Conclusions for the Biological Treatment of Waste – Reducing Generation of Waste Water and Water Usage

2.1.24.1 In order to reduce the generation of waste water and to reduce water usage, BAT is to use all of the techniques (referenced a to c) within the associated table.

BAT 35a – segregation of water streams

2.1.24.2 The segregation of water streams is considered to be generally applicable to new plants. As discussed in previous sections, the treatment process is undertaken within a contained system comprising tanks, reception buildings, transfer pipework and associated infrastructure. Therefore, it is considered that there are no direct pathways for process fluids to mix with clean surface run-off water by design.

2.1.24.3 Process areas are located on impermeable surfaces with sufficient secondary containment and sealed drainage systems which are designed in accordance with relevant CIRIA guidance (as per CIRIA document C736). This ensures that in the event of spills, leaks or other abnormal operating conditions, liquids are retained. Furthermore, the spillage procedures discussed previously will further ensure the segregation of water streams.

BAT 35b – Water recirculation

2.1.24.4 The treatment process comprises the progressive removal of contaminants from wet wastes (e.g. suspended solids, hydrocarbons and other pollutants) through staged physical, chemical and biological treatment.

2.1.24.5 The process is designed to treat and remove contaminants from these aqueous wastes with minimal need for dilution or additional water input, and to discharge treated effluent in compliance with consented limits attached to the existing trade effluent consent.

2.1.24.6 Additional Water is primarily used within the initial solids screening and washing process as well as during the flush points. Where possible, the operator will utilise clean, processed water derived from the recovery process (stored in the tanks marked final water tanks 2 and

3). Whilst a towns water connection is present onsite, it is not expected that water from this source will be routinely required for use.

2.1.24.7 Limited internal recirculation may also be undertaken where necessary for process control purposes (e.g. reprocessing of partially treated streams), as described under BAT 2. Therefore, the approach adopted is considered to represent BAT for this type of installation.

BAT 35c – Minimisation of the generation of leachate

2.1.24.8 Generation of secondary liquid wastes or leachates is minimised through both the design and purpose of the plant, all process liquids are contained within tanks, pipework and treatment infrastructure, and minimal additional water is added during processing.

2.1.24.9 Limited repackaging activities (e.g., drum bulking not including decanting) are conducted on impermeable surfaces with appropriate secondary containment, ensuring that any liquids arising are captured and may be removed from site via road tanker.

2.1.25 BAT 36 – BAT Conclusions for the Biological Treatment of Waste – Monitoring and Controlling Key Waste and Process Parameters

2.1.25.1 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. The monitoring and controlling of process and input parameters is inherent through the nature of the process and is achieved via the following measures:

- Waste inputs are monitored and controlled through the numerous pre-acceptance and sampling procedures described previously. This includes chemical and physical parameters that may influence treatment effectiveness or lead to increased emissions.
- Process conditions (flow rates, pH, suspended solids and aeration where biological micro organisms are applied) are monitored at multiple stages of the treatment system via sampling/testing (conducted by the onsite lab) to ensure optimal contaminant removal and to minimise odour generation.
- Temperature monitoring is not required as the process is designed to be undertaken at ambient temperature with no additional heating required.

- The process is batch operated and flushed following each campaign, allowing site management to ensure hazardous and non-hazardous waste inputs are separately processed without mixing or contamination.
- Moisture content is inherently controlled throughout the process, as the incoming waste streams are predominantly liquid, and recovered process water is used for flushing/solids recovery.

2.1.26 BAT 37 – Reducing Diffuse Emissions to Air of Dust and Bioaerosols from Open-Air Treatment Steps

2.1.26.1 BAT 37 describes techniques to reduce diffuse emissions of dust, odour, and bioaerosols from open-air treatment operations.

2.1.26.2 The process across buildings 1 and 2 does not undertake any open-air waste treatment; all processes are fully enclosed within dedicated hazardous and non-hazardous storage tanks, pipework, and process infrastructure.

2.1.26.3 By design, the treatment process prevents the uncontrolled release of dust, odour, or bioaerosols, achieving the underlying environmental objective of BAT 37 through enclosed processing, controlled transfer and secondary containment/sealed drainage.

2.1.26.4 Whilst a small proportion of incoming waste is subject to storage within the repackaging area (bulking of drums or containers), this process is conducted without decanting or pouring; liquids remain in sealed containers prior to removal from the site. The waste is stored within building 3, on impermeable surfaces with appropriate secondary containment, ensuring that any incidental spillage is captured and prevented from entering the surrounding areas. As such, even these minor operations do not result in open-air emissions of dust, odour or bioaerosols.

2.1.26.5 As such, the production of any diffuse emissions is inherently minimised and therefore the process is considered to be compliant with the environmental aims of BAT 37.

2.1.27 BAT 52 – BAT Conclusions for the Treatment of Water-Based Liquid Waste – Overall Environmental Performance

2.1.27.1 Reference should be made to the responses above in relation to BAT 2 for monitoring of waste input to be undertaken as part of Waste Pre-Acceptance and Acceptance procedures, which demonstrate compliance with BAT 52.

2.1.28 BAT 53 – BAT Conclusions for the Treatment of Water-Based Liquid Waste – Emissions to Air

2.1.28.1 The waste treatment operations will be undertaken within enclosed buildings, which will be operated under negative pressure. Air from the buildings will be treated within a dedicated abatement system, with additional dilution and dispersion to be achieved by discharging residual emissions through an elevated flue.

2.1.28.2 The abatement system will comprise a Nodour Hi-Flo 'twin bed' activated carbon system which is to be utilised in combination with an extraction fan and integral particulate pre-filter bed to protect carbon media.

2.1.28.3 The system will be maintained by the installation company who will inspect the unit periodically. If odour monitoring indicates the system is the source of an odour, the plant will be checked by an engineer forthwith and the filters replaced if they are considered to be malfunctioning. In routine operation, the filters will be changed at intervals recommended by the manufacturer.

2.1.28.4 The proposed abatement system accords with the requirements of BAT 53.

2.1.28.5 Proposed emissions monitoring arrangements will accord with the requirements of BAT 53, as outlined in the response to BAT 8 above.