

Natural Resources Wales permitting decisions

Variation and Consolidation of a bespoke Permit – FCC Recycling (UK) Limited

We have decided to issue a Natural Resources Wales initiated variation for Phase 2 – Wrexham Recycling Park in Wrexham operated by FCC Recycling (UK) Limited.

The permit number is EPR/BB3436RA.

We consider in reaching that decision we have taken into account all relevant considerations and legal requirements and that the permit will ensure that the appropriate level of environmental protection is provided.

The permit has been varied following the publication of the revised Best Available Techniques (BAT) Reference Documents (BREF) for Waste Treatment. The associated BAT conclusions to this document were published on 17 August 2018 in the Official Journal of the European Union.

This variation incorporates the changes required by the Industrial Emissions Directive following a statutory review of permits in the Waste Treatment sector. These include the amendment of the wording of several permit conditions relating to notifications, changes to emissions limits and monitoring requirements.

We are satisfied that the operator will be compliant with the published BAT conclusions which will apply from 17 August 2022.

Purpose of this document

This decision document:

- explains how we have carried out our statutory review of the Operator's Permit;
- why we have decided to vary the Permit as a result of that review; and
- why we have included the specific conditions in the revised Permit through the variation notice we are issuing.

It is our record of our decision-making process, to show how we have taken into account all relevant factors in reaching our position.

Structure of this document

- Assessment of Phase 2 – Wrexham Recycling Park against the published BAT conclusions for Waste Treatment.
- Annex 1 – Decision Checklist regarding relevant BAT Conclusions

Assessment of Phase 2 – Wrexham Recycling Park against the published BAT conclusions for Waste Treatment

1. Our decision

We have issued a variation, which will allow FCC Recycling (UK) Limited to operate the installation, subject to the conditions in the varied permit.

The variation does three things:

- it consolidates the original permit to reflect changes made through earlier variations;
- it brings the permit into line with our modern regulatory template; and

- it varies the permit where appropriate to reflect the outcome of our statutory review and incorporate Best Available Techniques (BAT) and Associated Emission Limit Values (BAT-AELs).

We consider that, in reaching this decision, we have taken into account all relevant considerations and legal requirements and that the permit will continue to ensure that a high level of protection is provided for the environment and human health.

The original permit, issued on the 18 April 2012 ensured that the installation employed Best Available Techniques (BAT) and ensured a high level of protection for human health and the environment. We have altered the permit as a result of the statutory review, and we are confident that the new requirements will deliver a superior level of protection to that which was previously achieved. Where a site is not currently compliant with BAT, Improvement Conditions have been included to bring the site up standard by 17 August 2022.

2. The legal framework

The Variation and Consolidation Notice (which includes the consolidated permit as Schedule 2) will be issued under Regulation 20 of the Environmental Permitting (England and Wales) Regulations 2016 (EPR). The environmental permitting regime is a legal vehicle which delivers most of the relevant legal requirements for activities falling within its scope. In particular, the regulated facility is:

- an *installation* as described by the Industrial Emissions Directive (IED);
- a waste operation subject to Environmental Permitting Regulations, however this review only applies to the installation activity as described by the Industrial Emissions Directive; and
- subject to aspects of other relevant legislation which also have to be addressed.

We consider that, in issuing the Variation and Consolidated Permit, it will ensure that the operation of the installation complies with all relevant legal requirements and that a high level of protection will be delivered for the environment and human health.

We explain how we have addressed specific statutory requirements more fully in the rest of this document.

3. How we reached our decision

Requesting information to demonstrate compliance with BAT Conclusion techniques

We issued a Notice under Regulation 61(1) of the Environmental Permitting (England and Wales) Regulations 2016 on 05 April 2019 requiring the operator to provide information to demonstrate how the operation of their installation currently meets, or will subsequently meet, the revised standards described in the relevant BAT Conclusions document.

The Regulation 61(1) Notice required the operator to:

- Describes the techniques that will be implemented before 17 August 2022, which will then ensure that operations meet the revised standard, or
- Justifies why standards will not be met by 17 August 2022, and confirmation of the date when the operation of those processes will cease within the installation or an explanation of why the revised BAT standard is not applicable to those processes, or
- Justifies why an alternative technique will achieve the same level of environmental protection equivalent to the revised standard described in the BAT Conclusions.
- Where their permitted activity involves the use, production or release of a hazardous substance, as defined in Article 3(18) of the Industrial Emissions Directive, FCC Recycling (UK) Limited were required to carry out a risk assessment considering the possibility of soil and groundwater contamination at the permitted installation with such substances. Where risk of such contamination is established prepare a baseline report containing information necessary to determine the state of soil and groundwater contamination so as to make a quantified comparison with the state upon definite cessation of the activity. FCC Recycling (UK) Limited have a copy of a consequent baseline report which is considered satisfactory.
- Where their permitted activity involves the use, production, storage or release of a priority hazardous substances and any other relevant substances, as defined by the Water Framework Directive, FCC Recycling (UK) Limited were required to carry

out a risk screening assessment considering the presence of priority hazardous substances at the permitted installation. Where a risk of these substances is established the operator is to sample the effluent and screen for the priority hazardous substances. If these substances are found to be present in the effluent stream, then assessment using the H1 tool and potential detailed modelling will be required to demonstrate that the effluent discharge will not have a significant impact to the receiving water. This was not undertaken by the operator and is subject to an improvement condition within the permit.

Where the operator proposed that they were not intending to meet a BAT standard, that also included a BAT Associated Emission Level (BAT-AEL) described in the Waste Treatment BAT Conclusions Document, the Regulation 61(1) Notice requested that the operator make a formal request for derogation from compliance with that AEL (as provisioned by Article 15(4) of IED). In this circumstance, the Notice identified that any such request for derogation must be supported and justified by sufficient technical and commercial information that would enable us to determine acceptability of the derogation request.

The Regulation 61(1) Notice response from the operator was received on the 26 September 2019 and additional information received on the 18 June 2020.

We considered that the response contained sufficient information for us to commence determination of the permit review. The operator made no claim for commercial confidentiality. We have not received any information in relation to the Regulation 61(1) Notice response that appears to be confidential in relation to any part.

4. Key issues/Regulation 61 response

BAT Conclusions for the Waste Treatment were published as Commission Implementing Decision EU 2018/1447 in the Official Journal of the EU on 17 August 2018. There are 53 BAT Conclusions. This annex provides a record of decisions made in relation to each relevant BAT Conclusion applicable to the installation. This should be read in conjunction with the permit/variation notice issued.

A detailed response was received from FCC Recycling (UK) Limited. Following assessment of the Regulation 61(1) response, further information was requested from FCC Recycling (UK) Limited. Where the operator has concluded that they have achieved BAT, and we are in agreement, no further information/justification has been sought by Natural Resources Wales.

5. Changes we have made

Improvement Conditions

Based on the information provided in the Regulation 61(1) response, we consider that we need to set improvement conditions. These conditions are set out below. We are using these conditions to require the operator to provide Natural Resources Wales with details that need to be established or confirmed during operations. The improvement conditions ensure compliance by 2022.

Reference	Requirement	Date
IC2	The Operator shall submit to Natural Resources Wales for written approval information to evidence compliance with BAT Conclusion 1 in accordance with the requirements specified within the BAT Conclusions of the Waste Treatment BREF Document (EU 2018). The Operator shall submit written confirmation that a Residues Management Plan and Odour Management Plan have been fully integrated into the sites Environmental Management System.	17th February 2022 or otherwise agreed in writing by Natural Resources Wales

IC3	The Operator shall submit to Natural Resources Wales for written approval information to evidence compliance with the following BAT requirements in accordance with the requirements specified within the BAT Conclusions of the Waste Treatment BREF Document (EU 2018) in relation to: • BAT 3 - in order to facilitate the reduction of emissions to water and air, BAT is to establish and to maintain an inventory of waste water and waste gas streams, as part of the Environmental Management System, that incorporates all of the following features: - o Information about the characteristics of the waste to be treated and the waste treatment processes; - o information about the characteristics of the waste water streams; and - o information about the characteristics of the waste gas streams. • BAT 6 – 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 point where the emission leaves the installation). BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality. • BAT 7 – is to monitor emissions to water with at least the frequency given within the table of BAT 7 and in accordance with EN standards. • BAT 20 – in order to reduce emissions to water, BAT is to treat waste water by using an appropriate combination of the techniques described within the table of BAT 20 with the associated BAT-AELs. • The Operator shall submit for written approval a methodology for meeting the relevant process parameters listed in Schedule 3b Table S3.3, following completion of BAT 3. The methodology shall identify each of the relevant process parameters and detail the frequency and techniques in place to record the data (outlined in BAT 7 and BAT 20).	17th February 2022 or otherwise agreed in writing by Natural Resources Wales
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	Where a process parameter cannot be monitored justification should be provided and/or a suitable alternative proposed. The methodology should include trigger levels for each of the relevant parameters identified with associated procedures in place if trigger levels are exceeded.	
IC4	The Operator shall complete and submit for approval a Phase 1 screening test report for priority hazardous pollutants and any other relevant priority hazardous substances discharged to sewer. For any substance which is not screened out by the screening tests, further modelling (as described in the risk assessment guidance “Surface water pollution risk assessment for your environmental permit”) should be undertaken, and the results of the modelling submitted to NRW for approval.	17th February 2022 or otherwise agreed in writing by Natural Resources Wales
IC5	The Operator shall submit to Natural Resources Wales for written approval a methodology for meeting the emission limits and monitoring requirements listed in Schedule 3b Table S3.1. The methodology should identify each parameter and detail the frequency and techniques in place to record the data. If a parameter cannot be monitored, justification should be provided and/or a suitable alternative proposed.	17th February 2022 or otherwise agreed in writing by Natural Resources Wales

IC2 – The operator does not currently have a formal Residues Management Plan within the sites Environmental Management System. However, it is noted that residues are actively managed through the specifications for the residual waste under the PFI contract for the facility. The operator also has an Odour Management Plan that was produced as part of the sites environmental permit application; however, this is also not currently within the sites Environmental Management System. This improvement condition is to formalise these documents into the sites existing Environmental Management System to meet the requirements of BAT Conclusion 1 of the Waste Treatment BREF.

IC3 – The installation is permitted for the discharge of leachate from the internal storage and treatment areas (bio-drying tunnels) to sewer, with the option for this to be tankered off site also permitted. The installation is also permitted to discharge

effluent from the road sweeping processing facility to sewer or for this effluent to also be tankered off site. In regard to the discharge from the MBT installation, as there is a pathway to the environment from this permitted activity the potential impact needs to be considered. In order to reduce emissions to water and air, BAT Conclusion 3 is to establish and maintain an inventory of waste water and waste gas streams. This forms part of the installations Environmental Management System and will incorporate features such as information about the characteristics of the waste to be treated, the waste treatment process and information about the characteristics of the waste water streams from the emission pathways. Within Schedule 3b Table S3.2 of the permit, parameters have been listed but these are subject to the substances concerned being identified within the waste water inventory within this improvement condition.

Of the relevant emissions to water identified by the inventory of waste water streams identified within BAT Conclusion 3, BAT Conclusion 6 is to monitor the key process parameters such as waste water flow, pH, temperature and conductivity. This should be undertaken at key monitoring locations such as at the point where the emission leaves the installation. BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality.

Monitoring of these emissions to water will be at the frequency provided within the tables of BAT Conclusion 7 and in accordance with EN standards. In order to reduce emissions to water, BAT Conclusion 20 is to treat waste water using an appropriate combination of techniques described and in accordance to the BAT-AELs.

The Operator shall submit for written approval a methodology for meeting the relevant process parameters listed in Schedule 3b Table S3.2, following completion of BAT Conclusion 3. The methodology shall identify each of the relevant process parameters and detail the frequency and techniques in place to record the data (outlined in BAT Conclusions 7 and 20). Where a process parameter cannot be monitored justification should be provided and/or a suitable alternative proposed. The methodology should include trigger levels for each of the relevant parameters identified with associated procedures in place if trigger levels are exceeded.

IC4 - The Operator shall complete and submit for approval a Phase 1 screening test report for priority hazardous pollutants and any other relevant priority hazardous substances discharged to sewer. For any substance which is not screened out by the screening tests, further modelling (as described in the risk assessment guidance

“Surface water pollution risk assessment for your environmental permit”) should be undertaken, and the results of the modelling submitted to Natural Resources Wales for approval.

IC5 - The Operator shall submit to Natural Resources Wales for written approval a methodology for meeting the emission limits and monitoring requirements listed in Schedule 3b Table S3.1 point source emissions to air. The methodology should identify each parameter and detail the frequency and techniques in place to record the data. If a parameter cannot be monitored, justification should be provided and/or a suitable alternative proposed.

Operational Changes

There are no operational changes.

Other Changes

A number of changes have been made to the permit conditions to reflect the latest standards and any previous omissions. The following conditions have been added to the permit:

1.2 Energy efficiency

1.2.1 For the following activities referenced in schedule 1, table S1.1 (A1 to A3) The operator shall:

- (a) take appropriate measures to ensure that energy is used efficiently in the activities;
- (b) review and record at least every four years whether there are suitable opportunities to improve the energy efficiency of the activities; and
- (c) take any further appropriate measures identified by a review.

1.3 Efficient use of raw materials

1.3.1 For the following activities referenced in schedule 1, table S1.1 (A1 to A3) The operator shall:

- (a) take appropriate measures to ensure that raw materials and water are used efficiently in the activities;
- (b) maintain records of raw materials and water used in the activities;
- (c) review and record at least every four years whether there are suitable alternative materials that could reduce environmental impact or

- opportunities to improve the efficiency of raw material and water use;
and
- (d) take any further appropriate measures identified by a review.

2.3 Operating techniques

- 2.3.3 The operator shall ensure that where waste produced by the activities is sent to a relevant waste operation, that operation is provided with the following information, prior to the receipt of the waste:
 - (a) the nature of the process producing the waste;
 - (b) the composition of the waste;
 - (c) the handling requirements of the waste;
 - (d) the hazardous property associated with the waste, if applicable; and
 - (e) the waste code of the waste.
- 2.3.4 The operator shall ensure that where waste produced by the activities is sent to a landfill site, it meets the waste acceptance criteria for that landfill.

3.6 Pests

- 3.6.1 The activities shall not give rise to the presence of pests which are likely to cause pollution, hazard or annoyance outside the boundary of the site. The operator shall not be taken to have breached this condition if appropriate measures, including, but not limited to, those specified in any approved pest's management plan, have been taken to prevent or where that is not practicable, to minimise the presence of pests on the site.
- 3.6.2 The operator shall:
 - (a) if notified by Natural Resources Wales, submit to Natural Resources Wales for approval within the period specified, a pest's management plan which identifies and minimises risks of pollution, hazard or annoyance from pests;
 - (b) implement the pest's management plan, from the date of approval, unless otherwise agreed in writing by Natural Resources Wales

3.7 Fire

- 3.7.1 The operator shall manage and operate the activities in accordance with a written fire prevention plan using the current, relevant fire prevention and mitigation plan guidance.
- 3.7.2 The operator shall:

- (a) if notified by Natural Resources Wales that the activities could cause a fire risk, submit to Natural Resources Wales a fire prevention and mitigation plan which identifies and minimises the risks of fire;
- (b) Operate the activity in accordance with the fire prevention and mitigation plan, from the date of submission, unless otherwise agreed in writing by Natural Resources Wales.

A further change has also been made to activity reference A1 within the listed activities table S1.1. The activity listed in Schedule 1 of the EP Regulations has been changed to S5.4A(1)(b)(i) to reference biological treatment. This is as opposed to pre-treatment of waste for incineration or co-incineration which was currently within the permit.

A change was also made to Schedule 4 of the permit to include additional reporting requirements that were previously omitted. This includes the reporting of the total amount of waste treated at the installation in addition to the reporting of performance parameters such as water and energy usage, generation of residues and waste water and total raw material usage.

A final change was made to the bioaerosol monitoring requirements to reflect the latest 'M9 – Technical Guidance Note (Monitoring) – Environmental monitoring of bioaerosols at regulated facilities' guidance. This involved the removal of the 'gram negative' monitoring requirements as this is not required within the latest guidance. The monitoring frequency was also updated to six monthly as previously agreed in writing with Natural Resources Wales.

Emissions to Water

As part of our delivery of the Water Framework Directive requirements, we need to identify and assess the impact for all discharges to surface waters and/or sewer from the site for priority hazardous substances and any other relevant substances. The emissions monitoring for these substances should be carried out using the methods and standards described in the M18 guidance on "Monitoring of discharges to water and sewer".

With reference to the risk assessment guidance on the gov.uk website entitled "Surface water pollution risk assessment for your environmental permit" (accessible

via: <https://www.gov.uk/guidance/surface-water-pollution-risk-assessment-for-your-environmental-permit>) the company carried out the following assessments:

- Screening tests for priority hazardous pollutants and any other relevant priority hazardous substances.
- For any substance which is not screened out by the screening tests further modelling, as described in the risk assessment guidance “Surface water pollution risk assessment for your environmental permit”.

The response to this notice stated that there are no emissions to surface waters and/or sewer from the permitted activities. However, the site is permitted to collect and store leachates from internal storage and treatment areas pending discharge to sewer or to be tankered off site. The road sweeping processing facility is also permitted for dirty water to be discharged to sewer or also to be tankered off site. It is understood that there have been no discharges to sewer, with the road sweeping facility yet to be commissioned and that within the main MBT installation there is a penstock valve which is closed. However, as there are permitted activities that allow for the discharge to sewer the assessment needs to be undertaken. This has therefore been included in IC3.

Emissions to Air

There were changes to the Emission Limit Values (ELV's) for emissions to air taking into account the BAT conclusions from the Waste Treatment BREF.

The tables below outline the parameters and limits set to implement the BAT-AELs:

Effective until 16 August 2022

Release point	Parameter	Limit/ BAT AEL	Effective from
No monitoring requirements			

Effective from 17th August 2022

Release point	Parameter	Limit/ BAT AEL	Effective from
A1	Odour	1,000 ou _E /Nm ³	17 th August 2022
	Dust	5 mg/Nm ³	17 th August 2022
	TVOC	40 mg/Nm ³	17 th August 2022

Emissions to Air – Article 15(4) Derogations

A derogation was initially requested to BAT Conclusion 34 for the BAT-AEL odour concentration of 1,000 ou_E/Nm³. No information was provided as justification for this derogation, with an odour modelling report submitted through a request for further information. After discussing the derogation requirements with the consultant acting on behalf of the operator, it was decided that a derogation would not be applied for.

A further request was also made under BAT 8 for a reduced monitoring frequency for the new emission to air requirements.

Background

The Industrial Emission Directive (IED) came into force on the 6 January 2011 and was transposed into law in England and Wales through an amendment to the Environmental Permitting Regulations.

The purpose of the IED is to achieve a high-level protection for the environment taken as a whole from the harmful effects of industrial activities. To achieve this, each industrial installation listed within the Directive must comply with BAT and AELs as set out in reference documents on BAT (Brefs).

Article 15 (4) of the directive does allow competent authorities, such as Natural Resources Wales, to set less strict AELs than detailed in the Bref provided certain criteria are met.

Article 15 (4) states: “By way of derogation from paragraph 3, and without prejudice to Article 18¹, the competent authority may, in specific cases, set less strict emission limit values. Such a derogation may apply only where an assessment shows that the achievement of emission levels associated with the best available techniques as described in BAT conclusions would lead to disproportionately higher costs compared to the environmental benefits due to:

¹ Article 18 states: “Where an environmental quality standard requires stricter conditions than those achievable by the use of best available techniques, additional measures shall be included in the permit, without prejudice to other measures which may be taken to comply with environmental quality standards.”

- (a) the geographical location or the local environmental conditions of the installation concerned; or
- (b) the technical characteristics of the installation concerned.

The competent authority shall document in an annex to the permit conditions the reasons for the application of the first subparagraph including the result of the assessment and the justification for the conditions imposed.”

There are therefore two parts of Article 15(4) that need to be addressed. First, there must be a technical, geographical or local environmental reason for a derogation. Second, the applicant must show that the costs of achieving the BAT-AEL is disproportionate to the environmental benefit gained.

A derogation request should include:

- (a) Are there geographical or local environmental reasons for a derogation?
- (b) Are there technical reasons for a derogation?
- (c) A cost benefit analysis demonstrating the cost of achieving BAT is disproportionate to the environmental benefit.

The Derogation Request

The Operator initially requested a derogation to BAT Conclusion 34 for the BAT-AEL odour concentration of 1,000 ou_E/Nm³. A further request was also made for a reduced monitoring frequency for the new emission to air requirements of odour, dust and TVOC.

Derogation from BAT Conclusion 34

The initial request submitted stated that the facility was designed with an air emission abatement system to meet an odour emission limit of 1,000 ou_E/Nm³ under normal operational conditions. It is stated that in practice the facility routinely complies with this limit but that on occasions this has been exceeded.

The operator commissioned a report in 2015 to undertake an environmental assessment of the impact the potential higher odour emissions may have on the surrounding environment. The work involved the use of complex air dispersion modelling software ADMS 5.1, which was stated as demonstrating that even at odour concentrations significantly higher than what is routinely measured as being emitted from the Facility, odour concentrations at the site boundary and at the locations of

sensitive receptors will remain below the threshold at which they are likely to cause offence/pollution.

To reduce the odour emission limits to below 1,000 ou_E/Nm³, the report states that this would require the retrofitting of additional air treatment infrastructure, that would likely comprise chemical absorption using activated carbon.

On the basis of the findings of the emission to air modelling exercise, it was stated that the current emission levels are not considered to cause offence/pollution at sensitive receptors. The cost and complexity of retrofitting additional treatment infrastructure plus the ongoing cost of replacing and disposing of the activated carbon media is considered to represent a disproportionately high cost when compared to the negligible environmental benefits it would offer. No evidence was provided to justify this statement.

The derogation request was initially assessed against the relevant criteria outlined below.

Are there geographical or local environmental reasons for a derogation?

It is acknowledged that the report states that odour concentrations at the site boundary and at the locations of sensitive receptors will be below the threshold at which they are likely to cause offence/pollution. However, this alone does not provide adequate justification to reduce the levels of environmental protection, considering that it is stated that the facility routinely complies with the BAT-AEL limit and when considering all other criteria. It is noted that the odour modelling report provided is over five years old and it is unclear whether this reflects the current conditions at the site, such as whether there have been any changes in sensitive receptors.

Are there technical reasons for a derogation?

Limited technical reasons for the derogation were provided, which stated that the facility would be required to retrofit additional air treatment infrastructure, that would likely comprise of chemical absorption using activated carbon. The cost and complexity of retrofitting additional treatment infrastructure plus the ongoing cost of replacing and disposing of the activated carbon media was stated as being disproportionately high in terms of the cost when compared to the negligible environmental benefits it would offer. No further justification or technical information was provided.

A cost benefit analysis demonstrating the cost of achieving BAT is disproportionate to the environmental benefit.

A cost benefit analysis has not been provided other than the statement outlining that any retrofitting or addition to the air treatment system would be disproportionately high in terms of cost when compared to the negligible environmental benefits it would offer.

Natural Resources Wales did discuss the potential to apply the BAT-AEL for ammonia as BAT 34 states that either the odour or ammonia limit can be used. Due to the existing monitoring systems in place for odour, the operator elected to stick with this limit.

Conclusion

Natural Resources Wales do not consider there to be any justification for a derogation from the BAT-AEL odour concentration, due to insufficient information being provided. Upon discussing this with the consultant acting on behalf of the operator, it was decided that the derogation request would be removed.

Reduced Monitoring Frequency

The request submitted asks for a reduced monitoring frequency for the new emission to air requirements of odour, dust and TVOC.

Monitoring of odour

Monitoring of odour emission to air has been conducted by olfactometry on an annual basis since the Facility became operational. The annual monitoring of odours conducted has been stated as demonstrating that the emission levels are sufficiently stable, and as such annual testing was stated as being considered sufficient to provide adequate environmental protection.

Monitoring of dust

The Facility is equipped with a dust and particulates filter (referred to as the 'de-duster' unit) to remove dust and particulates entrained in the air within the treatment building, prior to that air being recirculated back into the building. The emissions to air treatment system includes a cross-flow scrubber to remove entrained dust, particulates (and ammonia) in the extracted airflow. The air is further treated through a bio-filter which is primarily designed to remove odours from being emitted to air, but also traps any particulates that may not have been caught by the scrubber unit.

The combined filtering capacity applied at the Facility is designed so that no direct dust emissions can be emitted to air via the stack under normal operating conditions. This is stated as being sufficient to negate the need for routine dust emission monitoring.

Monitoring of TVOC

The volatile organic compounds (TVOC) generated in the waste treatment process are captured and treated within the air emission treatment infrastructure described above. The residual volatile substances emitted have been previously characterised using gas chromatography analysis, which has specified the volatile compounds present. This test work has stated that the volatile compounds present in the emission to air are at low concentrations. For treated emission to air from biological treatment facilities, it is considered that odour concentration by olfactometry is a more meaningful measure of potential pollution than quantification of totalised volatile compounds, as olfactometry accounts for the effect of effects between different compounds present e.g. combining, masking, etc. As periodic odour monitoring is conducted already, the additional test of TVOC is stated as not considered to offer any additional environmental protection at the Facility.

Conclusion

Natural Resources Wales do not consider there to be sufficient justification to reduce the monitoring frequency for the new emission to air parameters. However, Natural Resources Wales are committed to work with the operator to review additional monitoring data to discuss further whether reduced monitoring can be undertaken.

Other IED BREFs relevant to the permit review

There are no specific listed activities within Table S1.1 of the permit that are within scope of other published BREFS.

6. Conclusion

We consider that the installation already employed what used to be BAT. The revised BREF and its BAT-AELs provide the opportunity to consider further environmental improvements.

Coupled with the consolidation and modernisation of the permit, we believe this variation provides a sound basis for ongoing regulation of the installation and we are

satisfied that the operator is currently achieving or will be achieving all relevant BAT by 17 August 2022.

We believe that we have ensured compliance with all relevant legal requirements in carrying out this review and making our determination on the variation.

Annex 1: Decision checklist regarding relevant BAT Conclusions

BAT Conclusions for the Waste Treatment Bref were published as a Commission Implementing Decision ((EU 2018/1147) in the Official Journal of the EU on 10 August 2018. There are 53 BAT Conclusions. This checklist provides a record of decisions made in relation to each relevant BAT Conclusion applicable to the installation. This annex should be read in conjunction with the consolidated variation notice.

All BAT Conclusions arising are listed by number in order below;

BATc number	Summary of BAT Conclusion requirement	Status/comment One of the following: Not Applicable, Currently Compliant, Compliant in the future (within 4 years of publication of BAT conclusions), Not Compliant
OVERALL ENVIRONMENTAL PERFORMANCE		
1	Environment Management System (EMS) – <u>ALL</u> of the following:	
	I. Management commitment	Currently Compliant – The installation is managed in accordance with an Integrated Management System (IMS) that has been certified by an independent auditor (British Standards Institute) to be compliant to ISO 14001:2015 standard for environmental management systems with the following sections within the installations IMS.
	II. Environmental policy development including CI of performance	
	III. Planning and implementing procedures & targets in conjunction with financial planning & investment	
	IV. Implementation of procedures	
	(a) Structure & responsibility	
	(b) Recruitment, training, awareness & competence	

BATc number		Summary of BAT Conclusion requirement	Status/comment One of the following: Not Applicable, Currently Compliant, Compliant in the future (within 4 years of publication of BAT conclusions), Not Compliant
		(c) Communication	Currently Compliant – as above, current component of the IMS.
		(d) Employee involvement	
		(e) Documentation	
		(f) Effective process control	
		(g) Maintenance programmes	
		(h) Emergency preparedness & response	
		(i) Safeguarding compliance with environmental legislation	
	V.	<i>Checking performance and taking corrective action</i>	
		(a) Monitoring & measurement	
		(b) Corrective and preventive action	
		(c) Maintenance of records	
		(d) Independent (where practicable) internal or external EMS auditing	
	VI.	Senior management review of EMS	
	VII.	Following development of cleaner technologies	
	VIII.	Whole life cycle considerations when designing a new plant i.e. impacts from eventual decommissioning and throughout its operating life	
	IX.	Regular sectoral bench marking	
	X.	Waste stream management (BAT 2)	
	XI.	Inventory of waste water & waste gas streams (BAT 3)	Compliant in the Future – to be updated as per IC2 within the permit.

BATc number		Summary of BAT Conclusion requirement	Status/comment One of the following: Not Applicable, Currently Compliant, Compliant in the future (within 4 years of publication of BAT conclusions), Not Compliant
	XII.	Residues Management Plan – S6.5	Compliant in the future - The residues management plan does not currently exist as a formal document within the IMS but residues management is actively managed through specifications for residual waste under the PFI Contract. Subject to IC2 within the permit.
	XIII.	Accident Management Plan – S6.5	Currently Compliant – Component of IMS.
	XIV.	Odour Management Plan (BAT 12)	Compliant in the future - A site-specific odour management plan was produced for the facility in January 2012 as part of the environmental permit application. Although not listed in the IMS summary, this document is maintained as part of the IMS document register. Subject to IC2 within the permit.
	XV.	Noise & Vibration Management Plan (BAT 17)	Currently Compliant – Component of IMS.
2	Improving overall environmental performance – <u>ALL</u> of the following:		
	a.	Set up and implement waste characterisation & pre-acceptance procedures	Currently Compliant – Waste characterisation of the MSW supplied to the Facility has been characterised to inform the design of the Facility. The incoming waste stream is routinely checked for compliance by validation testing of its physical properties and chemical constituents on a monthly basis.
	b.	Set up and implement waste acceptance procedures	Currently Compliant – Waste acceptance procedures are applied at the Facility. They are defined in the Waste Rejection Policy implemented under the PFI Contract.
	c.	Set up and implement a waste tracking system & inventory	Currently Compliant – MSW is supplied to the Facility by a council fleet of RCVs of waste collected from kerb-side and FCC fleet from regional HWRCs under a PFI Contract. The collection aspect of the

BATc number	Summary of BAT Conclusion requirement		Status/comment One of the following: Not Applicable, Currently Compliant, Compliant in the future (within 4 years of publication of BAT conclusions), Not Compliant
			contract includes the tracking of waste collected by source and quantity at the Facility.
	d.	Set up and implement an output quality management system	Currently Compliant – The quality of the output wastes are controlled through the use of the Facility’s Supervisory Control And Data Acquisition (SCADA) system and managerial oversight in the effective running of the plant. The specifications of the output material are routinely tested to demonstrate that the Facility is operating within the specification defined within the PFI Contract and off-takers contracts.
	e.	Ensure waste segregation	Currently Compliant – All wastes received are mixed at source. Following treatment, all segregated fractions are stored separately.
	f.	Ensure waste compatibility prior to mixing or blending	Currently Compliant – No mixing or blending of waste is conducted as part of the MBT technique.
	g.	Sort solid incoming waste – S6.4	Currently Compliant – Sorting is a fundamental element of the plant’s function.
3	Establish and maintain a waste water and waste gas inventory as part of the EMS - <u>ALL</u> of the following:		
	<i>Information on characteristics of waste and waste treatment processes</i>		
	(i)(a)	simplified process flow sheets showing emission sources	Compliant in the Future – The Facility is equipped with an automated process control system that provides simplified process flow diagrams of the process and the origin of emissions. No waste water is generated by the Facility under normal operating conditions. Information about the performance of air emission treatment system including its performances is given in the O&M manuals and the IMS. Subject to IC2 within the permit.

BATc number		Summary of BAT Conclusion requirement		Status/comment One of the following: Not Applicable, Currently Compliant, Compliant in the future (within 4 years of publication of BAT conclusions), Not Compliant				
	(i)(b)	Process-integrated and waste water/waste gas treatment descriptions including performance		Compliant in the Future – details as per the above.				
Information on characteristics of waste water streams								
(ii)(a)	Mean and variability of:		Compliant in the Future – details as per the above.					
	Flow							
	pH							
	Temperature							
	Conductivity							
(ii)(b)	Mean concentration, load and variability of:							
	Total suspended solids							
	COD/TOC							
	Nitrogen species							
	Phosphorous							
	Metals							
	Priority substances/micropollutants							
	Any other relevant compounds							
(ii)(c)	Bioeliminability data (see BAT 52):							
	BOD							
	BOD to COD ratio							
	Zahn-Wellens test							
	Biological inhibition potential							
Information on characteristics of waste gas streams								
(iii)(a)	Mean and variability of:							

BATc number		Summary of BAT Conclusion requirement	Status/comment One of the following: Not Applicable, Currently Compliant, Compliant in the future (within 4 years of publication of BAT conclusions), Not Compliant
		Flow	Currently Compliant – Flow rate, pressure, temperature and oxygen concentration of emissions air is measured continuously by the SCADA system. Odour concentrations of emissions to air are measured periodically in accordance with an Odour Management Plan only.
		temperature	
	(iii)(b)	<i>Mean concentration, load and variability of relevant substances:</i>	
		Organic compounds	
		POPs e.g. PCBs	
		Any other relevant compounds	
	(iii)(c)	Flammability	
		Lower and Higher Explosive Limits	
		Reactivity	
	(iii)(d)	<i>Presence of other substances that may affect the gas treatment system or plant safety:</i>	
		O2	
		N2	
		Water vapour	
		Dust	
4	Reducing environmental risk associated with waste storage – <u>ALL</u> of the following:		Currently Compliant – The design of the Facility's layout is such that all waste is stored within the building and located on impermeable surfaces with sealed drainage system. The location of the waste storage areas are designed to minimise any unnecessary handling of wastes.
	a.	Optimised storage location	

BATc number		Summary of BAT Conclusion requirement	Status/comment One of the following: Not Applicable, Currently Compliant, Compliant in the future (within 4 years of publication of BAT conclusions), Not Compliant
	b.	Adequate storage capacity	Currently Compliant – The capacity of the storage areas are sufficient so that the Facility is not operationally compromised. Management procedures are in place to ensure that storage capacities are not exceeded.
	c.	Safe storage operation	Currently Compliant – The safe storage of waste is subject to design and management controls which include specialist waste handling equipment that can only be used by competent staff. All waste is stored in designed for purpose storage areas. Monitoring measures and control procedures are in place to minimise the risk of waste fires occurring. A Fire Prevention Plan is in place. Nonconforming waste inputs are quarantined.
	d.	Separate area for storage & handling of packaged hazardous waste	Currently Compliant – No packaged hazardous waste is received at the site and therefore is not applicable to the Facility. Hazardous waste in the form of ammonia sulphate from the air emissions treatment system is stored separately from all other wastes.
5	Set up and implement procedures to reduce the environmental risk associated with handling and transfer of waste - include following elements:		Currently Complaint – All waste received in the Facility is handled through the treatment process using automated conveyors, plant and equipment. Treated wastes are transferred to containers e.g. skips which are then transferred using mobile plant or collection vehicles e.g. RoRos. Only competent staff are permitted to use waste handling and transfer equipment. Management measures are in place to prevent, detect and mitigate spills.
	Carried out by competent staff		
	Duly documented, validated and verified		
	Spill prevention, detection and mitigation measures		
	Take precautions when mixing or blending wastes		
Procedures are risk-based and consider likelihood of accidents, incidents and their environmental impact			

BATc number		Summary of BAT Conclusion requirement	Status/comment One of the following: Not Applicable, Currently Compliant, Compliant in the future (within 4 years of publication of BAT conclusions), Not Compliant
MONITORING			
6	Relevant emissions to water: monitor key process parameters at key locations		
	Key process parameters		
	Waste water flow	Compliant in the Future – The Facility states that it does not generate any waste water streams under normal operating conditions and that there are no emissions to water from the Facility. The waste water generated within the biological process stage is collected within a sealed storage system. The process water is filtered using a bow sieve only. When required by the process, waste water is recirculated into the biological process stage. The volume of waste water generated in the process and stored is monitored by the SCADA system and checked by management daily to confirm that the Facility is operating to performance requirements. However, the facility is permitted for the discharge of leachate to sewer which needs to be considered and is subject to IC2.	
	pH		
	Temperature		
	Conductivity		
	BOD		
	Other process parameters		
	Key monitoring locations		
	Pre-treatment inlet and/or outlet	As above	
	Final treatment inlet		
	Discharge point (to the environment)		

BATc number		Summary of BAT Conclusion requirement	Status/comment One of the following: Not Applicable, Currently Compliant, Compliant in the future (within 4 years of publication of BAT conclusions), Not Compliant
	Other location		
7	Monitoring emissions to water (refer to table) Monitoring parameters depend on waste treatment process(es) involved		Compliant in the Future – As stated above for BAT 6 and subject to IC2.
8	Monitoring emissions to air (refer to table) Monitoring parameters depend on waste treatment process(es) involved		Compliant in the future – Subject to IC2.
9	Monitoring diffuse emissions of organic compounds to air from processes involving solvents. Use one or a combination of the following:		
	a	Measurement – S6.2 descriptions	Not Applicable - Only non-hazardous MSW is accepted at the Facility. No spent solvents, equipment containing POPs with solvents are received at the Facility therefore BAT 9 is not considered applicable.
	b	Emissions factor calculation	
	c	Mass balance calculation	
10	Periodically monitor odour emissions where nuisance is expected and/or has been substantiated (monitoring frequency is outlined in BAT 12)		
	Use EN standards e.g. 13725 or 16841		Currently Complaint – An Odour Management Plan is in use which describes how: - Sniff tests are conducted daily around the site perimeter - Emissions to air shall be monitored routinely to EN13725.
	Use equivalent methods e.g. ISO / national / international monitoring standards		Not Applicable
11	Annual monitoring for:		
	- Water, energy and raw materials		Currently Compliant – Usage of water and energy is monitored by the SCADA system and reported within an Energy Management report on a monthly basis. The report is in the form of a spreadsheet which calculates efficiency and highlights actions to target high usage.

BATc number		Summary of BAT Conclusion requirement	Status/comment One of the following: Not Applicable, Currently Compliant, Compliant in the future (within 4 years of publication of BAT conclusions), Not Compliant
			Energy usage is monitored and managed under a management system independently certified to ISO50001.
		- Generation of residues and waste water	Currently Compliant – The usage of raw materials within the Facility is limited lubricants used in the maintenance of equipment and the periodic supply of sulphuric acid and biofilter media (both approximately 5 yearly).
EMISSIONS TO AIR			
12	Set up, implement and review an Odour Management Plan (as part of the site EMS) where nuisance is expected and/or has been substantiated. Include <u>ALL</u> of the following:		
	Protocol containing actions and timelines		Currently Complaint – An Odour Management Plan (OMP) is in place which is linked to the IMS. The OMP sets out the odour prevention and reduction measures that are applied, the procedures for odour monitoring and the response in the event of odour incidents such as complaints.
	Protocol for conducting odour monitoring (BAT 10)		
	Protocol for response to odour incidents/complaints		
	Odour prevention and reduction programme		
13	Techniques to prevent, or where not practicable reduce odour emissions. Use one or a combination of the following:		
	a.	Minimising residence times (open systems only)	Currently Complaint – The minimisation of residence times of odorous wastes in storage or in the process handling systems, is automatically controlled through the SCADA. The SCADA is constantly monitored by operational management staff to ensure the process throughput is optimised.

BATc number	Summary of BAT Conclusion requirement		Status/comment One of the following: Not Applicable, Currently Compliant, Compliant in the future (within 4 years of publication of BAT conclusions), Not Compliant
	b.	Use chemical treatment (N/A if desired output is hampered)	Currently Compliant – Chemical treatment is currently applied using sulphuric acid to remove any gaseous ammonia from the emission to air, prior to biological treatment in the biofilter.
	c.	Optimising aerobic treatment – see examples. Refer to BAT 36 for wastes other than water-based liquid waste.	Currently Compliant – The biological stage of the treatment operation involves aerobic treatment of waste. The optimisation of the aerobic treatment is controlled through the SCADA system and managerial oversight to ensure that the tunnels are sufficiently filled with material of a suitable bulk density.
14	Techniques to prevent, or where not practicable reduce diffuse emissions to air, in particular of dust, organic compounds and odour. Use one or a combination of the following:		
	a.	Minimising potential diffuse emission sources – see examples	Currently Compliant – The techniques stated in BAT 14 have been applied to the design of the facility and through the operational maintenance and monitoring programme that is in use.
	b.	Select and use high-integrity equipment – see examples	Currently Compliant – The minimisation of potential diffuse emission sources is fundamental to the Facility building design, which includes a limited number of doors, which are kept closed unless in use, plus a high specification building to provide containment of process air. All plant and equipment are specified as suitable for use in its application. All items of plant and equipment are covered by a preventative maintenance programme, which also covers corrosion prevention.
	c.	Corrosion prevention – see examples	
	d.	Containment, collection and treatment of diffuse emissions – see examples	
	e.	Dampening (with water or fog)	
	f.	Maintenance – see examples	
	g.	Cleaning of waste treatment and storage areas – see examples	
	h.	Leak Detection And Repair (LDAR) programme for organics – S6.2	

BATc number		Summary of BAT Conclusion requirement	Status/comment One of the following: Not Applicable, Currently Compliant, Compliant in the future (within 4 years of publication of BAT conclusions), Not Compliant
			All elements of the plant are subject to a formal cleaning programme. Leak detectors are applied to power and water utilities and are performance measured and optimised through the Energy Management Plan (see BAT23).
15	Use flaring only for safety reasons or non-routine operating conditions (OTNOC). Use <u>both</u> of the following:		Not Applicable
	a.	Correct plant design – see examples	
	b.	Plant management including gas system balancing and advanced process control	
16	Reduce emissions to air when flaring is unavoidable. Use <u>both</u> of the following:		Not Applicable
	a.	Correct design of flaring devices – see examples	
	b.	Monitoring and recording as part of flare management – see examples	
NOISE AND VIBRATIONS			
17	Set up, implement, and regularly review a Noise and Vibration Management Plan (as part of the EMS) where nuisance is expected and/or has been substantiated. Include <u>ALL</u> of the following:		Currently Compliant – A noise and vibration risk assessment and management plan has been set up and implemented as part of the Facility’s Environmental Risk Assessment, which forms part of the
	I.	Protocol with actions and timelines	
	II.	Noise and vibration monitoring plan/protocol	
	III.	Noise & vibration complaint response plan/protocol	

BATc number	Summary of BAT Conclusion requirement		Status/comment One of the following: Not Applicable, Currently Compliant, Compliant in the future (within 4 years of publication of BAT conclusions), Not Compliant
	IV.	Noise and vibration reduction programme	Facility's IMS. Noise and vibration monitoring was conducted as part of the Facility's commissioning works to assess the levels of noise and vibration during operational hours and to compare those against the limits determined under the Facility's planning. The monitoring concluded that the noise and vibration levels recorded were within the levels of acceptability. Noise and vibration levels are assessed daily as part of the site perimeter checks and these findings are considered as part of the Facility's IMS. Protocols for responding to any elevated levels of noise and/or vibration identified by site staff or complaints from 3rd parties are provided in the IMS. Routine noise and vibration monitoring are conducted on applicable items of plant and equipment in accordance with occupational health requirements.
18	Techniques to prevent, or where not practicable reduce noise and vibration emissions. Use one or a combination of the following:		Currently Compliant – The location of the Facility has been determined as appropriate to the prevention of noise and vibration emission through the planning permission application process. The operational practices that are applied are done so within a building that has been determined to meet acceptable levels of operational noise and/or vibration. All plant and equipment are subject to an inspection and preventative maintenance programme. Routine occupational noise testing is conducted on applicable plant and equipment and action taken accordingly as necessary to ensure that limits are not exceeded. Operational measures include closing
	a.	Appropriate location of equipment and buildings	
	b.	Operational measures – see examples	
	c.	Low-noise equipment – see examples	
	d.	Noise & vibration control equipment – see examples	
	e.	Noise attenuation – see examples	

BATc number		Summary of BAT Conclusion requirement	Status/comment One of the following: Not Applicable, Currently Compliant, Compliant in the future (within 4 years of publication of BAT conclusions), Not Compliant
			facilities doors when not in use. All operational plant and equipment are operated within the facility's building.
EMISSIONS TO WATER			
19	Optimise water consumption, reduce waste water generation and prevent or where not practicable reduce emissions to soil and water. Use one or a combination of the following:		
	a.	Water management – see examples	Currently Compliant – The Facility has water management measures including leak detection and active monitoring and management controls to ensure that water is effectively managed through the process.
	b.	Water recirculation	Currently Compliant – The Facility is equipped with process water storage tanks that are used to recirculate water back into the process. The operation is conducted on fully impermeable surfaces. In the unlikely event of a process water spillage, emergency measures are in place that include spill kits and isolation valves to ensure that process water does not enter controlled waters.
	c.	Impermeable surface	
	d.	Reduce likelihood and impact of tank/vessel overflows and failures – see examples	
	e.	Roofing of waste storage and treatment areas	
	f.	Segregation of water streams (being mindful of existing plant constraints)	
	g.	Adequate drainage infrastructure	All wastes are received, treated and stored within the covered building. This prevents any contact with rainwater and thereby minimises the volume of contaminated water.
	h.	Design and maintenance provisions to allow risk-based leak detection and repair. Minimise use of underground components.	

BATc number		Summary of BAT Conclusion requirement	Status/comment One of the following: Not Applicable, Currently Compliant, Compliant in the future (within 4 years of publication of BAT conclusions), Not Compliant
	i.	Appropriate buffer storage capacity (being mindful of existing plant constraints)	The capacity of the process water storage tanks is sufficient for abnormal operating conditions.
20	Treat waste water using a combination of:		
	Preliminary, primary and general treatment		
	a.	Equalisation	Compliant in the Future – Subject to IC2.
	b.	Neutralisation	
	c.	Physical separation	
	Physico-chemical treatment		
	d.	Adsorption	Compliant in the Future – Subject to IC2.
	e.	Distillation/rectification	
	f.	Precipitation	
	g.	Chemical oxidation	
	h.	Chemical reduction	
	i.	Evaporation	
	j.	Ion exchange	
	k.	Stripping	
	Biological treatment		
	l.	Activated sludge process	Compliant in the Future – Subject to IC2.
	m.	Membrane bioreactor	
	Nitrogen removal		
	n.	Nitrification/denitrification (where biological treatment used)	Compliant in the Future – Subject to IC2.

BATc number	Summary of BAT Conclusion requirement	Status/comment One of the following: Not Applicable, Currently Compliant, Compliant in the future (within 4 years of publication of BAT conclusions), Not Compliant
	Solids removal	
	o.	Coagulation and flocculation
	p.	Sedimentation
	q.	Filtration (sand, micro, ultra)
	r.	Flotation
	Compliant in the Future – Subject to IC2.	
	BAT-AELs for DIRECT discharges to a receiving waterbody (mg/l)	
	Table 6.1 and its supporting notes. Monitoring requirements are outlined in BAT 7	
	TOC	10.0-60 10-100 for water-based liquid waste
	COD (TOC is preferred)	30-180 30-300 for water-based liquid waste
	Suspended solids	5.0-60
	HOI	0.5-10 applying to specific waste treatments
	Total N	1-25 for biological treatment and waste oil re-refining 10-60 for water-based liquid waste
	Total P	0.3-2 for biological treatment 1-3 for water-based liquid waste
	Phenol	0.05-0.2 for waste oil re-refining and physio-chemical treatment of waste with CV
Not Applicable		

BATc number		Summary of BAT Conclusion requirement	Status/comment One of the following: Not Applicable, Currently Compliant, Compliant in the future (within 4 years of publication of BAT conclusions), Not Compliant
		0.05-0.3 for water-based liquid waste	
	Free CN-	0.02-0.1 for water-based liquid waste	
	AOX	0.2-1 for water-based liquid waste	
	Metals & Metalloids – specific waste treatments as listed in Table 6.1		Not Applicable
	As	0.01-0.05	
	Cd	0.01-0.05	
	Cr	0.01-0.15	
	Cu	0.05-0.5	
	Pb	0.05-0.1	
	Ni	0.05-0.5	
	Hg	0.5-5	
	Zn	0.1-1	
	Metals & Metalloids – treatment of water-based liquid waste		
	As	0.01-0.1	
	Cd	0.01-0.1	
	Cr	0.01-0.3	
	Hexavalent Cr [Cr(VI)]	0.01-0.1	
	Cu	0.05-0.5	

BATc number		Summary of BAT Conclusion requirement	Status/comment One of the following: Not Applicable, Currently Compliant, Compliant in the future (within 4 years of publication of BAT conclusions), Not Compliant
	Pb	0.05-0.3	Not Applicable
	Ni	0.05-1	
	Hg	1.0-10	
	Zn	0.1-2	
	BAT-AELs for INDIRECT discharges to a receiving waterbody (mg/l)		
	Table 6.2 and its supporting notes. Monitoring requirements are outlined in BAT 7		
	HOI	0.5-10 applying to specific waste treatments	Compliant in the Future – Subject to IC2.
	Free CN-	0.02-0.1 for water-based liquid waste	
	AOX	0.2-1 for water-based liquid waste	
	Metals & Metalloids – specific waste treatments as listed in Table 6.2		
	As	0.01-0.05	
	Cd	0.01-0.05	
	Cr	0.01-0.15	
	Cu	0.05-0.5	
	Pb	0.05-0.1	
	Ni	0.05-0.5	
	Hg	0.5-5	
	Zn	0.1-1	
	Metals & Metalloids – treatment of water-based liquid waste		
	As	0.01-0.1	
Cd	0.01-0.1		
Cr	0.01-0.3		

BATc number		Summary of BAT Conclusion requirement	Status/comment One of the following: Not Applicable, Currently Compliant, Compliant in the future (within 4 years of publication of BAT conclusions), Not Compliant
	Hexavalent Cr [Cr(VI)]	0.01-0.1	Compliant in the Future – Subject to IC2.
	Cu	0.05-0.5	
	Pb	0.05-0.3	
	Ni	0.05-1	
	Hg	1.0-10	
	Zn	0.1-2	
EMISSIONS FROM ACCIDENTS AND INCIDENTS			
21	Techniques to prevent or limit the environmental consequences of accidents and incidents, as part of the Accident Management Plan. Use <u>ALL</u> of the following:		
	a.	Protection measures – see examples	Currently Compliant – Protection measures against malevolent acts including site security measures, staff training and managerial oversight of competent staff. Fire prevention measures (defined within a Fire Prevention Plan) are applied.
	b.	Management of incidental or accidental emissions	Currently Compliant – Management procedures are in place covering accidents and incidences including spillages and firewater.
	c.	Incident/accident registration and assessment system – see examples	Currently Compliant – The IMS includes a system for recording all accidents, incidences, changes to procedures and the findings of

BATc number	Summary of BAT Conclusion requirement	Status/comment One of the following: Not Applicable, Currently Compliant, Compliant in the future (within 4 years of publication of BAT conclusions), Not Compliant
		inspections as well as procedures to cover investigation and remedial action and continual improvement.
MATERIAL EFFICIENCY		
22	Use materials efficiently by substituting materials with waste e.g. waste acids/alkalis for pH adjustment, fly ashes for binders	Currently Compliant – No materials are added to the waste treatment process, other than the following: - The application of water to the biological process, which is subject to design and management efficiency measures, including the recirculation of process wastewater. - The use of sulphuric acid (H₂SO₄) is used in the air treatment system to remove NH₃. The resulting reaction between the gaseous ammonia and the sulphuric acid produces ammonium sulphate ((NH₄)₂SO₄) as a product. The process results in the generation of a waste stream. No sources of waste sulphuric acid have been identified, however work is being progressed to assess the efficiency of the emissions to air treatment activity. Should it be concluded that ammonia scrubbing by chemical treatment is unnecessary, the use of acid (and therefore the generation of waste) shall be removed, subject to regulatory approval.

BATc number	Summary of BAT Conclusion requirement	Status/comment One of the following: Not Applicable, Currently Compliant, Compliant in the future (within 4 years of publication of BAT conclusions), Not Compliant
		- Virgin wood is used as a media in the biofilter, which is required to be replaced approximately every 5 years. This material could be substituted with waste wood, subject to regulatory approvals.
ENERGY EFFICIENCY		
23	Use energy efficiently by using <u>both</u> of the following techniques:	
	a.	Energy efficiency plan
	b.	Energy balance record
Currently Compliant - An Energy Management Plan is in use to track the usage of energy used in the Facility. The data generated within the Plan is reviewed by FCC's operational management, with performance criteria that seeks to reduce consumption.		
REUSE OF PACKAGING		
24	Maximise the reuse of packaging as part of a Residues Management Plan (see BAT 1 XII.)	Not Applicable – No packaging waste is generated by the treatment activity.
MECHANICAL TREATMENT OF WASTE (GENERAL BAT)		
25	Reduce emissions to air of dust, particulate-bound metals, PCDD/F and dioxin-like PCBs by applying BAT 14d <u>AND</u> using one or a combination of the following techniques:	
	a.	Cyclone – see S6.1
	b.	Fabric filter – see S6.1
Not Applicable		

BATc number		Summary of BAT Conclusion requirement	Status/comment One of the following: Not Applicable, Currently Compliant, Compliant in the future (within 4 years of publication of BAT conclusions), Not Compliant
	c.	Wet scrubbing – see S6.1	
	d.	Water injection into the shredder	
	BAT-AEL for channelled dust emissions to air from the mechanical treatment of waste (mg/Nm3)		
	Table 6.3 and its supporting note. Monitoring requirements are outlined in BAT 8		
	Dust	2.0-5.0	Not Applicable
MECHANICAL TREATMENT OF METAL WASTE BY SHREDDING			
26	Improve overall environmental performance and prevent emissions due to accidents and incidents. Use BAT 14g <u>AND ALL</u> of the following techniques:		Not Applicable
	(a)	Detailed inspection procedure for baled waste before shredding	
	(b)	Remove dangerous items from waste inputs and dispose of them in a safe manner	
	(c)	Treatment of containers accompanied by a declaration of cleanliness	
27	Prevent deflagrations and reduce emissions from deflagrations. Use technique a. <u>AND ONE OR BOTH</u> of techniques b. and c.		Not Applicable
	a.	Deflagration management plan with reduction programme, incident review and response protocol	
	b.	Pressure relief dampers	
	c.	Pre-shredding (device)	
28	Use energy efficiently by keeping the shredder feed stable		

BATc number	Summary of BAT Conclusion requirement	Status/comment One of the following: Not Applicable, Currently Compliant, Compliant in the future (within 4 years of publication of BAT conclusions), Not Compliant
MECHANICAL TREATMENT OF WEEE CONTAINING VFCS AND/OR VHCS		
29	Techniques to prevent, or where not practicable reduce emissions of organic compounds to air. Apply BAT 14d <u>AND</u> BAT14h <u>AND</u> technique a. <u>AND ONE OR BOTH</u> of techniques b. and c.	
	a.	Optimised removal and capture of refrigerants and oils
	b.	Cryogenic condensation
	c.	Adsorption
	Not Applicable	
	BAT-AELs for channelled TVOC and CFC emissions to air from treatment of WEEE containing VFCS and/or VHCS (mg/Nm3) <i>Table 6.4. Monitoring requirements are outlined in BAT 8</i>	
	TVOC	3.0-15
	CFCs	0.5-10
Not Applicable		
30	Prevent emissions due to explosions when treating WEEE containing VFCS and/or VHCS. Use <u>EITHER</u> of the following techniques:	
	a.	Inert atmosphere e.g. N2
	b.	Forced ventilation
Not Applicable		
MECHANICAL TREATMENT OF WASTE WITH CALORIFIC VALUE		
31	Reduce emissions to air of organic compounds by applying BAT 14d <u>AND</u> using one or a combination of the following techniques:	
	a.	Adsorption – see S6.1
	b.	Biofilter – see S6.1
	c.	Thermal oxidation – see S6.1
	d.	Wet scrubbing – see S6.1
Not Applicable		
BAT-AEL for channelled TVOC emissions to air from the mechanical treatment of waste with calorific value (mg/Nm3)		

BATc number		Summary of BAT Conclusion requirement	Status/comment One of the following: Not Applicable, Currently Compliant, Compliant in the future (within 4 years of publication of BAT conclusions), Not Compliant
Table 6.5 and its supporting note. Monitoring requirements are outlined in BAT 8			
TVOC		10.0-30.0	Not Applicable
MECHANICAL TREATMENT OF WEEE CONTAINING MERCURY			
32	Reduce mercury emissions to air by collecting them at source, sending them to abatement and carrying out adequate monitoring. This includes <u>ALL</u> of the following:		
	Equipment is enclosed, under negative pressure and connected to a LEV system		Not Applicable
	Waste gas treated using dedusting techniques – see examples – followed by adsorption on activated carbon		
	Monitoring of waste gas treatment efficiency		
	Mercury levels measured at least weekly within treatment and storage areas		Not Applicable
	BAT-AEL for channelled mercury (Hg) emissions to air from the mechanical treatment of WEEE containing mercury (µg/Nm3)		
	Table 6.6. Monitoring requirements are outlined in BAT 8		
Hg		2.0-7.0	Not Applicable
BIOLOGICAL TREATMENT OF WASTE (GENERAL BAT)			
33	Reduce odour emissions and improve overall environmental performance by selecting the waste input (to ensure its suitability for biological treatment). See also BAT 2		Currently Compliant – The waste streams received at the Facility are municipal solid waste from the Wrexham locality, which is supplied by a fleet of RCVs operated by Wrexham Borough Council

BATc number		Summary of BAT Conclusion requirement	Status/comment One of the following: Not Applicable, Currently Compliant, Compliant in the future (within 4 years of publication of BAT conclusions), Not Compliant
			(WBC). The waste has been characterised under Contract to ensure that the facility can treat it, while retaining overall environmental performance including odour emissions.
34	Reduce emissions to air of dust, organic compounds and odorous compounds (including H2S & NH3) by using one or a combination of the following techniques:		
	a.	Adsorption – see S6.1	Currently Compliant – Dust entrained in the air within the mechanical treatment Processing Hall is treated in a fabric filter. Prior to release of emissions to air, the air is pre-treated in an acid wet scrubber to precondition the air prior to it being treated in a biofilter. The pre-conditioning stage reduces any ammonia and dust present and humidifies the air. The biofilter removes odorous compounds. Hydrogen sulphate treatment is not applicable as the MBT activity treats the waste aerobically.
	b.	Biofilter – see S6.1	
	c.	Fabric filter – see S6.1.	
	d.	Thermal oxidation – see S6.1	
	e.	Wet scrubbing – see S6.1	
	BAT-AEL for channelled NH3, odour, dust and TVOC emissions to air from the biological treatment of waste (mg/Nm3) (ouE/m3) Table 6.7 and its supporting notes. Monitoring requirements are outlined in BAT 8		
	NH3	0.3-20	Compliant in the future – subject to IC4.
	Odour	200-1000	
	Dust	2.0-5.0	
	TVOC	5.0-40	
	35	Reduce the generation of waste water and reduce water usage by using ALL of the following:	
a.		Segregation of water streams (see also BAT 19f)	Currently Compliant – as described under BAT 19.
b.		Water recirculation	

BATc number		Summary of BAT Conclusion requirement	Status/comment One of the following: Not Applicable, Currently Compliant, Compliant in the future (within 4 years of publication of BAT conclusions), Not Compliant
	c.	Minimisation of the generation of leachate	
BIOLOGICAL TREATMENT OF WASTE: AEROBIC METHODS			
36	Reduce emissions to air and improve overall environmental performance by monitoring and/or controlling key waste and process parameters. Include following elements:		Currently Compliant – The facility benefits from an automated Supervisory Control And Data Acquisition (SCADA) system which provides real-time waste process parameters, including temperature and moisture content and aeration of the tunnel.
	Waste input characteristics e.g. C to N ratio, particle size		
	Temperature and moisture content within windrows (Moisture monitoring not needed for enclosed processes where H&S issues have been identified)		
	Aeration of the windrow		
	Windrow porosity, height and width		
37	Reduce diffuse emissions to air of dust, odour and bioaerosols from open-air treatment steps. Use <u>ONE OR BOTH</u> of the following techniques:		Not Applicable – There are no open-air treatment steps applied at the facility, therefore BAT37 is not considered applicable to the Facility.
	a.	Use of semi-permeable membrane covers	
	b.	Adaptation of operations to the meteorological conditions	
BIOLOGICAL TREATMENT OF WASTE: ANAEROBIC METHODS			
38	Reduce emissions to air and improve overall environmental performance by monitoring and/or controlling key waste and process parameters. Include following elements:		
	Implement a manual and/or automatic monitoring system to:		

BATc number		Summary of BAT Conclusion requirement	Status/comment One of the following: Not Applicable, Currently Compliant, Compliant in the future (within 4 years of publication of BAT conclusions), Not Compliant
	Ensure a stable digester operation		Not Applicable
	Minimise operational difficulties and associated odour emissions		
	Provide sufficient early warning of system failures		
	Windrow porosity, height and width		
	Monitoring and/or control of key waste and process parameters – examples below:		
	pH and alkalinity of the digester feed		Not Applicable
	Digester operating temperature		Not Applicable
	Hydraulic and organic loading rates of the digester feed		
	Volatile fatty acids and NH3 concentrations within digester & digestate		
	Biogas quantity, composition (e.g. H2S) and pressure		
	Liquid and foam levels in the digester		
MECHANICAL BIOLOGICAL TREATMENT (MBT) OF WASTE			
39	Reduce emissions to air. Generally applicable to new plants, existing plants may have layout constraints. Use BOTH of the following techniques:		Currently Compliant – Both techniques are applied in the design and operation of the process air control system. Air from the processing halls is separated from the air supplied and removed from the biological stage (having a proportionally higher pollutant content) of the process.
	a.	Segregation of the waste gas streams (refer to inventory described in BAT 3)	
	b.	Recirculation of waste gas. Waste gas treatment is described in BAT 34 and recirculation in BAT 35.	

BATc number		Summary of BAT Conclusion requirement	Status/comment One of the following: Not Applicable, Currently Compliant, Compliant in the future (within 4 years of publication of BAT conclusions), Not Compliant
			The recirculation of waste gas from the treatment halls is used as input air to the biological stage. The waste gas treatment system is designed as suitable for the concentration of pollutants generated.
PHYSICO-CHEMICAL TREATMENT OF SOLID AND/OR PASTY WASTE			
40	Improve overall environmental performance by monitoring the waste input as part of the waste pre-acceptance and acceptance procedures. See also BAT 2.		
	Monitoring the waste input		
	Content of organics, oxidising agents, metals, salts, odorous compounds	Not Applicable	
H2 formation potential upon mixing of flue-gas treatment residues/ashes with water			
41	Reduce emissions to air of dust, organic compounds and NH3 by applying BAT 14d <u>AND</u> using one or a combination of the following techniques:		
	a.	Adsorption – see S6.1	Not Applicable
	b.	Biofilter – see S6.1	
	c.	Fabric filter – see S6.1.	
	d.	Wet scrubbing – see S6.1	
BAT-AEL for channelled NH3, odour, dust and TVOC emissions to air from the physico-chemical treatment of solid and/or pasty waste (mg/Nm3)			
Table 6.8. Monitoring requirements are outlined in BAT 8			

BATc number		Summary of BAT Conclusion requirement	Status/comment One of the following: Not Applicable, Currently Compliant, Compliant in the future (within 4 years of publication of BAT conclusions), Not Compliant
	Dust	2.0-5.0	Not Applicable
RE-REFINING OF WASTE OIL			
42	Improve overall environmental performance by monitoring the waste input as part of the waste pre-acceptance and acceptance procedures. See also BAT 2.		
	<i>Monitoring the waste input</i>		
	Chlorinated compounds e.g. solvents or PCBs		Not Applicable
43	Reduce quantity of waste sent for disposal by using <u>ONE OR BOTH</u> of the following techniques:		
	a.	Material recovery e.g. organic residues in asphalt products	Not Applicable
	b.	Energy recovery	
44	Reduce emissions to air of organic compounds by applying BAT 14d <u>AND</u> using one or a combination of the following techniques:		
	a.	Adsorption – see S6.1	Not Applicable
	b.	Thermal oxidation – see S6.1	
	c.	Wet scrubbing – see S6.1	
	<i>The BAT-AEL for TVOC emissions to air set in Section 4.5 (below) applies.</i>		
<i>Monitoring requirements are outlined in BAT 8</i>			
PHYSICO-CHEMICAL TREATMENT OF WASTE WITH CALORIFIC VALUE			
45	Reduce emissions to air of organic compounds by applying BAT 14d <u>AND</u> using one or a combination of the following techniques:		
	a.	Adsorption – see S6.1	

BATc number		Summary of BAT Conclusion requirement	Status/comment One of the following: Not Applicable, Currently Compliant, Compliant in the future (within 4 years of publication of BAT conclusions), Not Compliant
	b.	Cryogenic condensation – see S6.1	Not Applicable
	c.	Thermal oxidation – see S6.1	
	d.	Wet scrubbing – see S6.1	Not Applicable
	<i>The BAT-AEL for TVOC emissions to air set in Section 4.5 (below) applies. Monitoring requirements are outlined in BAT 8</i>		
REGENERATION OF SPENT SOLVENTS			
46	Improve overall environmental performance by using ONE OR BOTH of the following techniques:		
	a.	Material recovery (by evaporation from distillation residues)	Not Applicable
	b.	Energy recovery e.g. using distillation residues	
47	Reduce emissions to air of organic compounds by applying BAT 14d AND using <u>a combination of</u> the following techniques:		
	a.	Recirculation of process off-gases in a steam boiler. Avoid generating PCBs and/or PCDD/Fs	Not Applicable
	b.	Adsorption – see S6.1	
	c.	Thermal oxidation – see S6.1. Avoid generating PCBs and/or PCDD/Fs	
	d.	Condensation or cryogenic condensation	
	e.	Wet scrubbing – see S6.1	
	<i>The BAT-AEL for TVOC emissions to air set in Section 4.5 (below) applies. Monitoring requirements are outlined in BAT 8</i>		

BATc number	Summary of BAT Conclusion requirement		Status/comment One of the following: Not Applicable, Currently Compliant, Compliant in the future (within 4 years of publication of BAT conclusions), Not Compliant
BAT-AEL FOR EMISSIONS OF ORGANIC COMPOUNDS TO AIR – SECTION 4.5 (RE-REFINING OF WASTE OIL) (PHYSICO-CHEMICAL TREATMENT OF WASTE WITH CV) (REGENERATION OF SPENT SOLVENTS)			
	BAT-AEL for channelled TVOC emissions to air from the re-refining of waste oil, physico-chemical treatment of waste with calorific value and regeneration of spent solvents (mg/Nm3) Table 6.9 and its supporting note. Monitoring requirements are outlined in BAT 8		
	TVOC	5.0-30	Not Applicable
THERMAL TREATMENT OF SPENT ACTIVATED CARBON, WASTE CATALYSTS AND EXCAVATED CONTAMINATED SOIL			
48	Improve overall environmental performance by using <u>ALL</u> of the following techniques:		
	a.	Heat recovery from the furnace off-gas e.g. for preheating combustion air or steam generation	Not Applicable
	b.	Indirectly fired furnace i.e. avoids contact between the furnace contents and the burner flue-gases. Note applicability constraints.	
	c.	Process-integrated techniques to reduce emissions to air – see examples	
49	Reduce emissions to air of HCl, HF, dust and organic compounds by applying BAT 14d <u>AND</u> using one or a combination of the following techniques:		
	a.	Cyclone – see S6.1	

BATc number		Summary of BAT Conclusion requirement	Status/comment One of the following: Not Applicable, Currently Compliant, Compliant in the future (within 4 years of publication of BAT conclusions), Not Compliant
	b.	Electrostatic precipitator (ESP) – see S6.1	Not Applicable
	c.	Fabric filter – see S6.1	
	d.	Wet scrubbing – see S6.1	
	e.	Adsorption – see S6.1	
	f.	Condensation – see S6.1	
	g.	Thermal oxidation – see S6.1	
	Note supporting text for BAT 49g (thermal oxidation) Monitoring requirements are outlined in BAT 8. No BAT-AELs have been set for this BATc.		
WATER WASHING OF EXCAVATED CONTAMINATED SOIL			
50	Reduce emissions to air of dust and organic compounds from the storage, handling and washing steps by applying BAT 14d <u>AND</u> using one or a combination of the following techniques:		Not Applicable
	a.	Adsorption – see S6.1	
	b.	Fabric filter – see S6.1	
	c.	Wet scrubbing – see S6.1	
Monitoring requirements are outlined in BAT 8. No BAT-AELs have been set for this BATc.			
Decontamination of equipment containing PCBs			
51	Reduce emissions to air of PCBs and organic compounds and improve overall environmental performance by using <u>ALL</u> of the following techniques:		

BATc number		Summary of BAT Conclusion requirement	Status/comment One of the following: Not Applicable, Currently Compliant, Compliant in the future (within 4 years of publication of BAT conclusions), Not Compliant
	a.	Coating of the storage and treatment areas – see examples	Not Applicable
	b.	Implementation of staff access rules to prevent dispersion of contamination – see examples	
	c.	Optimised equipment cleaning and drainage – see examples	
	d.	Control and monitoring of emission to air – see examples	
	e.	Disposal of waste treatment residues – see examples	
	f.	Recovery of solvent when solvent washing is used	
	Monitoring requirements are outlined in BAT 8. No BAT-AELs have been set for this BATc.		
TREATMENT OF WATER-BASED LIQUID WASTE			
52	Improve overall environmental performance by monitoring the waste input as part of the waste pre-acceptance and acceptance procedures. See also BAT 2.		
	Monitoring the waste input		
	Bioeliminability e.g. BOD, BOD-COD ratio, Zahn-Wellens test, biological inhibition potential		Not Applicable
Feasibility of emulsion breaking e.g. lab testing			
53	Reduce emissions to air of HCl, NH3 and organic compounds by applying BAT 14d <u>AND</u> using one or a combination of the following techniques:		
	a.	Adsorption – see S6.1	Not Applicable
	b.	Biofilter – see S6.1	

BATc number		Summary of BAT Conclusion requirement	Status/comment One of the following: Not Applicable, Currently Compliant, Compliant in the future (within 4 years of publication of BAT conclusions), Not Compliant
	c.	Thermal oxidation – see S6.1.	
	d.	Wet scrubbing – see S6.1	
	BAT-AELs for channelled HCl and TVOC emissions to air from the treatment of water-based liquid waste (mg/Nm3)		Not Applicable
	<i>Table 6.10 and its supporting notes. Monitoring requirements are outlined in BAT 8</i>		
	HCl	1.0-5.0	
TVOC	3.0-20		

Annex 2: Consultation on the draft decision where an Article 15(4) derogation has been applied

Not applicable as no longer applied for.