

Review of an Environmental Permit for an Installation subject to Chapter II of the Industrial Emissions Directive under the Environmental Permitting (England & Wales) Regulations 2016 (as amended)

Decision document recording our decision-making process following review of a permit

The Permit number is: EPR/PP3734LK

The Operator is: Wessex Water Services Limited

The Installation is: Avonmouth Bioresources Centre

This Variation Notice number is: EPR/PP3734LK/V014 and C015

What this document is about

Article 21(3) of the Industrial Emissions Directive (IED) requires the Environment Agency to review conditions in permits that it has issued and to ensure that the permit delivers compliance with relevant standards, within four years of the publication by the European Commission of updated decisions on BAT Conclusions.

We have reviewed the permit for this installation against the revised BAT Conclusions for the Waste Treatment industry sector published on 10 August 2018 in the Official Journal of the European Union. In this decision document, we set out the reasoning for the consolidated variation notice that we have issued.

It explains how we have reviewed and considered the techniques used by the Operator in the operation and control of the plant and activities of the installation. This review has been undertaken with reference to the decision made by the European Commission establishing Best Available Techniques (BAT) Conclusions (BATc) for Waste Treatment as detailed in document reference C(2018) 5070. It is our record of our decision-making process and shows how we have taken into account all relevant factors in reaching our position. It also provides a justification for the inclusion of any specific conditions in the permit that are in addition to those included in our generic permit template.

As well as considering the review of the operating techniques used by the Operator for the operation of the plant and activities of the installation, the consolidated variation notice takes into account and brings together in a single document all previous variations that relate to the original permit issue. Where this has not already been done, it also modernises the entire permit to reflect the conditions contained in our current generic permit template.

The introduction of new template conditions makes the Permit consistent with our current general approach and with other permits issued to Installations in this sector. Although the wording of some conditions has changed, while others have been deleted because of the new regulatory approach, it does not reduce the level of environmental protection achieved by the Permit in any way. In this document, we therefore address only our determination of substantive issues relating to the new BAT Conclusions and any changes to the operation of the installation.

We try to explain our decision as accurately, comprehensively and plainly as possible. Achieving all three objectives is not always easy, and we would welcome any feedback as to how we might improve our decision documents in future.

How this document is structured

1. Our decision
2. How we reached our decision
3. The legal framework
4. Annex 1: decision checklist regarding relevant BAT Conclusions for the existing food waste AD IED operation
5. Annex 2: Review and assessment of changes that are not part of the BAT Conclusions derived permit review
6. Annex 3: Improvement Conditions for food waste AD and gas infrastructure
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8. Annex 5: Document recording our decision-making process following the requirement for waste and wastewater sewerage treatment activities.
9. Annex 6 - Improvement conditions for sludge AD and bespoke waste operations.
10. Annex 7 – Decision considerations for the consolidation application (C015) and partial transfer (T016)
11. Annex 8 - Consultations

1 Our decision

We have decided to issue the Variation Notice to the operator. This will allow the operator to continue to operate the Installation, subject to the conditions in the Consolidated Variation Notice that updates the whole permit.

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

The Consolidated Variation Notice contains many conditions taken from our standard Environmental Permit template including the relevant annexes. We developed these conditions in consultation with industry, having regard to the legal requirements of the Environmental Permitting Regulations and other relevant legislation. This document does not therefore include an explanation for these standard conditions. Where they are included in the Notice, we have considered the techniques identified by the operator for the operation of their installation, and have accepted that the details are sufficient and satisfactory to make those standard conditions appropriate. This document does, however, provide an explanation of our use of “tailor-made” or installation-specific conditions, or where our Permit template provides two or more options.

2 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 (a Regulation 61 Notice) on 1 April 2022 requiring the operator to provide information to demonstrate where the operation of their installation currently meets, or how it will subsequently meet, the revised standards described in the relevant BAT Conclusions document.

The Notice required that where the revised standards are not currently met, the operator should provide information that:

- describes the techniques that will be implemented before 17 August 2022 (BAT Compliance Date), which will then ensure that operations meet the revised standards, 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 standards are not applicable to those processes, or
- justifies why an alternative technique will achieve the same level of environmental protection equivalent to the revised BAT standards described in the BAT Conclusions.

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 BAT Conclusions Document, the Regulation 61 Notice required that the operator make a formal request for derogation from compliance with that BAT-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 Notice response from the operator was received on 1 October 2022 (for the food waste AD).

We considered it was in the correct form and contained sufficient information for us to begin the permit review but not that it necessarily contained all the information we would need to complete the determination.

The Regulation 61 Notice response documents submitted for application EPR/PP3734LK/V014 relate to the solid fuel production activity currently permitted under a Section 5.5 Part A(1) (a) and the food waste anaerobic digestion (AD) activity currently permitted under a section 5.4 Part A(1)(b)(i). The Section 5.4 food waste AD activity was in operation until very recently and despite this activity being mothballed (as notified on the 14/05/2026) the very fact the activity was in operation until recently enabled a review to be carried out in accordance with the Regulation 61 notice. This was not the case for the Section 5.5 fuel palletisation activity, which has been out of operation for a significant timescale (multiple years) as notified on 10/03/2026. Due to the significant period of none operation and lack of up to date information relating to this activity, we were unable to review this activity in line with the regulation 61 notice. We have therefore mothballed the Section 5.5 fuel palletisation activity (as we have done with the food waste AD operation), however we have recommended that the operator seek to apply for a surrender application should they confirm that the Section 5.5 activity (AR2) will not to be recommenced/recommissioned in the future.

A variation application has also been determined as part of this application under EPR/PP3734LK/C015 and includes:

- The consolidation of permit EPR/UP3797EA which is a standard rules 2008 No19.
- An application to bring existing operations into regulation including:
 - The addition of an installation activity for a S5.4 A(1) (b) (i) Recovery or a mix of recovery and disposal of non-hazardous waste with a capacity exceeding 100 tonnes per day involving biological treatment relating to the anaerobic digestion of sludges produced by the WwTW.
 - The addition of a food soup waste operation activity
 - The addition of a dewatering of sludge waste operation activity

It should be noted that the combustion assets which include the five combined heat and power plants, boiler, emergency generator, two emergency flares and

biomethane upgrade plant are shared assets between the food waste AD and sludge AD.

On 2 April 2019, the Environment Agency confirmed to the Water and Sewerage Companies (WaSCs) operating in England that their sewage sludge anaerobic digestion (AD) facilities needed to comply with the Industrial Emissions Directive (IED).

The IED entered into force on 6 January 2011 and was transposed into UK law on 20 February 2013. The IED recast the Directive on integrated pollution prevention and control (IPPC) and introduced a revised schedule of industrial activities falling within the scope of its permitting requirements. The schedule of waste management activities includes the recovery of non-hazardous waste with a capacity exceeding 75 tonnes per day involving biological treatment, but excludes activities covered by the Urban Waste Water Treatment Regulations (UWWTR).

In July 2014 we deferred the need for the WaSCs to submit permit applications for these facilities to allow for further consideration of whether they were already covered under the UWWTR. All the UK environmental regulators subsequently concluded this was not the case, and therefore they come within the scope of the IED.

The IED seeks to achieve a high level of protection for the environment, taken as a whole, from the harmful effects of industrial activities. It does so by requiring each of the industrial installations to be operated under a permit with conditions based around the use of best available techniques (BAT).

The IED set a deadline of 7 January 2014 for existing sludge AD installations to obtain an environmental permit. Therefore, the implementation of this aspect of the IED had been delayed for over five years at the point of our confirmation to the WaSCs on 2 April 2019.

The BAT Conclusions for Waste Treatment was published on 17 August 2018 following a European Union wide review of BAT, implementing decision (EU) 2018/1147 of 10 August 2018. BAT applies to new waste sewage sludge treatment not covered by the UWWTR. The sewage sludge anaerobic digestion installation operations and dewatering waste activity at Avonmouth are existing but will be brought under environmental regulation for the first time and are required to operate using BAT.

Given the delay in implementing the IED in England, we subsequently have sought to ensure that all sewage sludge AD facilities obtain and operate under an environmental permit in as short a timescale as can reasonably be achieved. We asked the WaSCs to provide a definitive list of all facilities used to carry out biological treatment of sewage sludge. A submission schedule was provided to the WaSCs, allowing applications for these facilities to be submitted to us in

stages between 1 April 2021 and 1 October 2022. This application is part of this programme of work.

We sent requests for further information requiring the operator to provide information regarding several aspects of their Regulation 61 response and consolidation application on the 06/10/2026, 12/11/2025, 17/03/2026 and 29/04/2026.

We received additional information and the operator's responses on the 20/12/2023, 30/01/2025, 07/08/2025, 09/10/2025, 26/11/2025, 28/01/2026, 17/04/2026 and 14/05/2026.

The operator made no claim for commercial confidentiality. We have not received any information in relation to the Regulation 61 Notice response and consolidation application that appears to be confidential in relation to any party.

2.2 Review of our own information in respect to the capability of the Installation to meet revised standards included in the BAT Conclusions document for the food waste AD.

Based on our records and previous experience in the regulation of the installation we have no reason to consider that the Operator will not be able to comply with the techniques and standards described in the BAT Conclusions.

In August 2018, the revised Waste Treatment BAT Conclusions was published. These Conclusions identify techniques that can be considered BAT and specify BAT associated emission limits (BAT-AELs) for waste treatment installations. The BAT Conclusions were required to be implemented within 4 years through permit review and variations, and through securing compliance with those variations, at existing waste treatment installations. The deadline for compliance was 17th August 2022.

We wrote to all biological waste treatment operators in June 2019 notifying them about the Waste Treatment BAT Conclusions and permit review process. We wrote again in July and August 2021, to remind operators of the BAT compliance date and that they should ensure that their sites complied with BAT by 17th August 2022. We consider we provided operators with sufficient time to undertake the necessary improvements on site to comply with BAT or vary their permits to reduce waste treatment tonnages and operate as waste facilities.

During the permit review process, we provided the operator with an opportunity to respond to the Regulation 61 Notice with supporting evidence and confirm that they will be able to comply with the improvements we require to ensure BAT and BAT-AELs would be met. In addition, the operator had the opportunity to comment on the draft permit as part of the permit review process. The operator has not objected to the BAT requirements as stated in the permit or stated that these cannot be met. We consider that they can and will be met. Consequently, we expect compliance with the new requirements including the BAT-AELs. We will take enforcement action where existing permitted activities

are not compliant with BAT, in accordance with our enforcement and sanctions policy.

3 The legal framework

The Consolidated Variation Notice will be issued under Regulations 18 and 20 of the 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 IED;
- subject to aspects of other relevant legislation which also have to be addressed.

We consider that, in issuing the consolidated variation notice, 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.

Annex 1: decision checklist regarding relevant BAT Conclusions for the existing food waste AD IED operation

BAT Conclusions for Waste Treatment were published by the European Commission on 10 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 annex should be read in conjunction with the Consolidated Variation Notice.

The overall status of compliance with the BAT conclusion is indicated in the table as:

NA – Not Applicable

CC – Currently Compliant

**FC – Compliant in the future (following recommencement of activity
AR3)**

NC – Not Compliant

BAT Conclusi on No	Summary of BAT Conclusion requirement for Waste Treatment	Status NA/ CC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
1	In order to improve the overall environmental performance, BAT is to implement and adhere to an environmental management system (EMS) that incorporates all of the following features: I. commitment of the management, including senior management; II. definition, by the management, of an environmental policy that includes the continuous improvement of the environmental performance of the installation; III. planning and establishing the necessary procedures, objectives and targets, in conjunction with financial planning and investment; IV. implementation of procedures paying particular attention to: (a) structure and responsibility, (b) recruitment, training, awareness and competence, (c) communication, (d) employee involvement, (e) documentation, (f) effective process control, (g) maintenance programmes, (h) emergency preparedness and response, (i) safeguarding compliance with environmental legislation; V. checking performance and taking corrective action, paying particular attention to: (a) monitoring and measurement (see also the JRC Reference Report on Monitoring of emissions to air and water from IED installations – ROM), (b) corrective and preventive action, (c) maintenance of records,	CC	<u>Environment Agency assessment</u> The operator has provided information to support compliance with BATc 1. An EMS is in place and accredited to ISO 14001 certification. We have assessed the information provided and we are satisfied that the operator has demonstrated compliance.

BAT Conclusi on No	Summary of BAT Conclusion requirement for Waste Treatment	Status NA/ CC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
	(d) independent (where practicable) internal or external auditing in order to determine whether or not the EMS conforms to planned arrangements and has been properly implemented and maintained VI. review, by senior management, of the EMS and its continuing suitability, adequacy and effectiveness; VII. following the development of cleaner technologies; VIII. consideration for the environmental impacts from the eventual decommissioning of the plant at the stage of designing a new plant, and throughout its operating life; IX. application of sectoral benchmarking on a regular basis; X. waste stream management (see BAT 2); XI. an inventory of waste water and waste gas streams (see BAT 3); XII. residues management plan (see description in Section 6.5); XIII. accident management plan (see description in Section 6.5); XIV. odour management plan (see BAT 12) noise and vibration management plan (see BAT 17).		
2	In order to improve the overall environmental performance of the plant, BAT is to use all of the techniques listed below: (a) Set up and implement waste characterisation and pre-acceptance procedures; (b) Set up and implement waste acceptance procedures; (c) Set up and implement a waste tracking system and inventory; (d) Set up and implement an output quality management system; (e) Ensure waste segregation; (f) Ensure waste compatibility prior to mixing or blending of waste; (g) Sort incoming solid waste	FC	<u>Environment Agency assessment</u> The food waste AD operation is undertaken for recovery to produce digestate that will be certified as PAS 110 standard and achieve the requirements of the digestate resource framework to undergo recycling on farm land to aid crop growth. As part of this we have reviewed the current EWC codes and redefined them in accordance with the approved list in the biowaste permit review template. The waste codes that were not included in the approved list have been voluntarily removed by the operator from the permit as confirmed in correspondence received 13 August 2026.

BAT Conclusi on No	Summary of BAT Conclusion requirement for Waste Treatment	Status NA/ CC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
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 (see BAT 1), that incorporates all of the following features: (i) information about the characteristics of the waste to be treated and the waste treatment processes, including: (a) simplified process flow sheets that show the origin of the emissions; (b) descriptions of process-integrated techniques and waste water/waste gas treatment at source including their performances; (ii) information about the characteristics of the waste water streams, such as: (a) average values and variability of flow, pH, temperature, and conductivity; (b) average concentration and load values of relevant substances and their variability (e.g. COD/TOC, nitrogen species, phosphorus, metals, priority substances /micropollutants); (c) data on bioeliminability (e.g. BOD, BOD to COD ratio, Zahn-Wellens test, biological inhibition potential (e.g. inhibition of activated sludge)) (see BAT 52); (iii) information about the characteristics of the waste gas streams, such as: (a) average values and variability of flow and temperature; (b) average concentration and load values of relevant substances and their variability (e.g. organic compounds, POPs such as PCBs); (c) flammability, lower and higher explosive limits, reactivity; (d) presence of other substances that may affect the waste gas treatment system or plant safety (e.g. oxygen, nitrogen, water vapour, dust).	FC	<u>Environment Agency assessment</u> The food waste AD activity undertakes an indirect discharge to water at emission point S5. We have included improvement condition IC26. This IC requires the operator to submit a report following monitoring of the discharge of centrate from the food waste AD operation to capture information about the relevant characteristics of the emissions to establish an emissions inventory. IC26 requires the operator to undertake a full characterisation of the indirect emission to water and undertake an assessment of the results providing a summary of the sample results, a completed H1 risk assessment(s) and detailed modelling (where necessary). We also require the operator to submit proposals and/or additional measures required to prevent or minimise any significant emissions from the installation along with timescales for implementation. It should be noted that the relevant waste treatment process under BAT are the 'biological treatment of waste', 'all waste treatments' and 'all waste treatment except for water based liquid waste' as identified in the table for BATc 7. The operator has provided written confirmation that they will initiate a sampling programme to determine the composition of the waste water.
4	In order to reduce the environmental risk associated with the storage of waste, BAT is to use all of the techniques given below:	CC	<u>Environment Agency assessment</u>

BAT Conclusi on No	Summary of BAT Conclusion requirement for Waste Treatment	Status NA/ CC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
	(a) Optimised storage location; (b) Adequate storage capacity; (c) Safe storage operation; (d) Separate area for storage and handling of packaged hazardous waste.		The operator has provided information to support compliance with BATc 4. We have assessed the information provided and we are satisfied that the operator has demonstrated compliance.
5	In order to reduce the environmental risk associated with the handling and transfer of waste, BAT is to set up and implement handling and transfer procedures. Handling and transfer procedures aim to ensure that wastes are safely handled and transferred to the respective storage or treatment. They include the following elements: • handling and transfer of waste are carried out by competent staff; • handling and transfer of waste are duly documented, validated prior to execution and verified after execution; • measures are taken to prevent, detect and mitigate spills; • operation and design precautions are taken when mixing or blending wastes (e.g. vacuuming dusty/powdery wastes). Handling and transfer procedures are risk-based considering the likelihood of accidents and incidents and their environmental impact.	CC	<u>Environment Agency assessment</u> The operator has provided information to support compliance with BATc 5. We have assessed the information provided and we are satisfied that the operator has demonstrated compliance.
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 inlet and/or outlet of the pre-treatment, at the inlet to the final treatment, at the point where the emission leaves the installation).	FC	<u>Environment Agency assessment</u> We consider that the operator will be future compliant with BATc 6, as the permit will stipulate frequency and standards of monitoring for key process parameters, in accordance with BATc 6.

BAT Conclusi on No	Summary of BAT Conclusion requirement for Waste Treatment	Status NA/ CC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
7	BAT is to monitor emissions to water with at least the frequency given in BATc 7, and in accordance with EN standards. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality.	FC	<u>Environment Agency assessment</u> The food waste AD activity undertakes an indirect discharge to water at emission point S5. We have included improvement condition IC26. This IC requires the operator to submit a report following monitoring of the discharge of centrate from the food waste AD operation to capture information about the relevant characteristics of the emissions to establish an emissions inventory. IC26 requires the operator to undertake a full characterisation of the indirect emission to water and undertake an assessment of the results providing a summary of the sample results, a completed H1 risk assessment(s) and detailed modelling (where necessary). We also require the operator to submit proposals and/or additional measures required to prevent or minimise any significant emissions from the installation along with timescales for implementation. It should be noted that the relevant waste treatment process under BAT are the 'biological treatment of waste', 'all waste treatments' and 'all waste treatment except for water based liquid waste' as identified in the table for BATc 7. The operator has provided written confirmation that they will initiate a sampling programme to determine the composition of the waste water, testing for all pollutants expected to be present in the discharge. This review will be undertaken in line

BAT Conclusi on No	Summary of BAT Conclusion requirement for Waste Treatment	Status NA/ CC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
			with Environment Agency guidance Surface Water Pollution Risk Assessment for your environmental permit, and Monitoring Discharges to Water. The sampling will be undertaken by suitably trained internal teams that already undertake compliance sampling for Environment Agency discharge permits to MCERTS standards. Analysis will be undertaken in the operators own UKAS accredited laboratory or externally contracted UKAS accredited laboratories. We asked the operator via a request for further information to identify all point source emissions to water from the installation. The operator provided an updated site plan which included all sampling and discharge points to the adjacent WwTW. We have included the updated site plan in the permit.
8	BAT is to monitor channelled emissions to air with at least the frequency given in BATc 8, and in accordance with EN standards. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality.	FC	<u>Environment Agency assessment</u> We have updated the permit to include emission limits in line with BATc 8. We therefore consider that the operator will be future compliant with BATc 8, as the permit stipulates frequency and standards of monitoring for channelled emissions to air, in accordance with BATc 8.
10	BAT is to periodically monitor odour emissions. Odour emissions can be monitored using: • EN standards (e.g. dynamic olfactometry according to EN 13725 in order to determine the odour concentration or EN 16841-1 or -2 in order to determine the odour exposure); • when applying alternative methods for which no EN standards are available (e.g. estimation of odour impact), ISO, national or other	CC	<u>Environment Agency assessment</u> The Waste Treatment BREF outlines techniques for minimising the impact from odour pollution from operations which are likely to cause odour. Anaerobic digestion and the handling /storage of various waste sludges and organic wastes can be highly odorous. The Waste Treatment BREF includes general BAT conclusions which operators must implement (BAT 10 and 12 where odour nuisance at sensitive receptors is expected and/or has been substantiated.

BAT Conclusi on No	Summary of BAT Conclusion requirement for Waste Treatment	Status NA/ CC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
	international standards that ensure the provision of data of an equivalent scientific quality. The monitoring frequency is determined in the odour management plan (see BAT 12).		We asked the operator to confirm whether or not the site has a current, up-to-date odour management plan, as part of the Regulation 61 Notice. The operator provided a copy of the site odour management plan in their response to support compliance with BAT 10 and 12. We have reviewed the odour management plan and we are satisfied that the site complies with the requirements of Waste Treatment BAT conclusion 10 and 12. Effectiveness of existing abatement systems The installation includes industrial processes which produce waste gas and odour emissions that are discharged to air via vents or stacks. BAT conclusion 14 of the Waste Treatment BREF states that emissions from diffuse sources should use techniques like, <i>collecting and directing the emissions to an appropriate abatement system via an air extraction system and/or air suction systems close to the emission sources</i>. BAT conclusion 34 and 53 describe the use of appropriate techniques to reduce channelled emissions to air of dust, HCl, organic compounds and odorous compounds, including H₂S and NH₃. These are adsorption, biofilter, fabric filter, thermal oxidation and wet scrubbing. The abatement technique(s) employed at this installation are the gas to grid GAC biofilter and carbon OCU (emission A24), food waste biofilter (emission A30). The abatement system covers the following areas on site: • Gas to grid system

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			Food waste reception hall The treated air stream is then discharged to atmosphere via a stack. We did not assess the operator's abatement plant and its suitability in providing effective abatement during the permit review. As part of the Environment Agency approach to reduce emissions in the biowaste treatment sector, we have set an improvement condition (IC24b). The improvement condition requires the operator to demonstrate via determining the composition of waste gas emissions, monitoring and additional risk assessment that the existing abatement system effectively treats the emissions to air. Where further improvements are identified, the operator is required to implement these measures. It should be noted that a review of the existing system could determine that the existing systems are not suitable for the waste gas emissions. Where this is the case, further improvements on site may be required which may include the installation of new abatement plant. The installation of a new abatement plant will require a variation to the existing permit. Any new abatement plant will need to be designed to reduce odours and where required ammonia. For new abatement plant, an operator will need to ensure that new abatement systems achieve the BAT-AEL for odour or limits defined by the plant design, whichever is less. The BAT-AEL for odour concentration is 1,000 ouE/m³. Should the operator seek to

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			install an abatement system which cannot meet this requirement, it is unlikely that the abatement plant will be BAT.
11	BAT is to monitor the annual consumption of water, energy and raw materials as well as the annual generation of residues and waste water, with a frequency of at least once per year. Monitoring includes direct measurements, calculation or recording, e.g. using suitable meters or invoices. The monitoring is broken down at the most appropriate level (e.g. at process or plant/installation level) and considers any significant changes in the plant/installation.	CC	<u>Environment Agency assessment</u> The operator has provided information to support compliance with BATc 11. We have assessed the information provided and we are satisfied that the operator has demonstrated compliance.
12	In order to prevent or, where that is not practicable, to reduce odour emissions, BAT is to set up, implement and regularly review an odour management plan, as part of the environmental management system (see BAT 1), that includes all of the following elements: • a protocol containing actions and timelines; • a protocol for conducting odour monitoring as set out in BAT 10; • a protocol for response to identified odour incidents, e.g. complaints; an odour prevention and reduction programme designed to identify the source(s); to characterise the contributions of the sources; and to implement prevention and/or reduction measures.	CC	<u>Environment Agency assessment</u> The Waste Treatment BREF outlines techniques for minimising the impact from odour pollution from operations which are likely to cause odour. Anaerobic digestion and the handling /storage of various waste sludges and organic wastes can be highly odorous. The Waste Treatment BREF includes general BAT conclusions which operators must implement (BAT 10 and 12 where odour nuisance at sensitive receptors is expected and/or has been substantiated). We asked the operator to confirm whether or not the site has a current, up-to-date odour management plan, as part of the Regulation 61 Notice. The operator provided a copy of the site odour management plan in their response to support compliance with BAT 10 and 12. We have reviewed the odour management plan and we are satisfied that the site complies with the requirements of Waste Treatment BAT conclusion 10 and 12.

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13	In order to prevent or, where that is not practicable, to reduce odour emissions, BAT is to use one or a combination of the techniques given below: (a) Minimising residence times; (b) Using chemical treatment; (c) Optimising aerobic treatment	CC	<u>Environment Agency assessment</u> The operator has provided information to support compliance with BATc 13. We have assessed the information provided and we are satisfied that the operator has demonstrated compliance.
14	In order to prevent or, where that is not practicable, to reduce diffuse emissions to air, in particular of dust, organic compounds and odour, BAT is to use an appropriate combination of the techniques given below: (a) Minimising the number of potential diffuse emission sources; (b) Selection and use of high-integrity equipment; (c) Corrosion prevention; (d) Containment, collection and treatment of diffuse emissions; (e) Dampening; (f) Maintenance; (g) Cleaning of waste treatment and storage areas; (h) Leak detection and repair (LDAR) programme	FC	<u>Environment Agency assessment</u> The operator has provided information to support compliance with BATc 14. We have assessed the information provided and we are satisfied that the operator has demonstrated compliance with BAT 14 except for point d – containment collection and treatment for diffuse emissions. Emissions from open tanks On review of the application we identified that the post digestion storage tank and strain press buffer tank were not enclosed. We have therefore implemented IC17b for the operator to cover and either abate or direct emissions to the gas system. Emissions from limpet chambers To facilitate the physical filling operation of digestate containing vessels many WaSCs have incorporated limpet chamber boxes and riser pipes as part of the methodology for how vessels are filled and emptied. During determination we

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			have asked the operator to identify all limpet chamber boxes as point sources. We have therefore implemented IC22b for the operator to quantify the emission releases from the riser pipes and limpet box chambers using leak detection reporting methodology and to outline a programme of works to minimise the release of diffuse emissions to periods during fill and spill only or to consider replacement with a sealed system. Methane slip and Leak detection and repair (LDAR) As part of the Environment Agency approach to reduce methane emissions in the biowaste treatment sector, we have included improvement condition (IC21) in the permit which requires the operator to assess methane slip resulting from the combustion of biogas via the CHP engines. Following an assessment of the data, the Environment Agency shall consider whether emission limits for volatile organic compounds are applicable for this installation.
15	BAT is to use flaring only for safety reasons or for non-routine operating conditions (e.g. start-ups, shutdowns) by using both of the techniques given below: (a) Correct plant design; (b) Plant management	CC	<u>Environment Agency assessment</u> The operator has provided information to support compliance with BATc 15. We have assessed the information provided and we are satisfied that the operator has demonstrated compliance.
16	In order to reduce emissions to air from flares when flaring is unavoidable, BAT is to use both of the techniques given below: (a) Correct design of flaring devices; (b) Monitoring and recording as part of flare management	CC	<u>Environment Agency assessment</u> The operator has provided information to support compliance with BATc 16. We have assessed the information provided and we are satisfied that the operator has demonstrated compliance.

BAT Conclusi on No	Summary of BAT Conclusion requirement for Waste Treatment	Status NA/ CC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
17	In order to prevent or, where that is not practicable, to reduce noise and vibration emissions, BAT is to set up, implement and regularly review a noise and vibration management plan, as part of the environmental management system (see BAT 1), that includes all of the following elements: I. a protocol containing appropriate actions and timelines; II. a protocol for conducting noise and vibration monitoring; III. a protocol for response to identified noise and vibration events, e.g. complaints; a noise and vibration reduction programme designed to identify the source(s), to measure /estimate noise and vibration exposure, to characterise the contributions of the sources and to implement prevention and /or reduction measures.	NA	<u>Environment Agency assessment</u> The applicability is restricted to cases where a noise or vibration nuisance at sensitive receptors is expected and/or has been substantiated. The operator does have a noise management plan in place.
18	In order to prevent or, where that is not practicable, to reduce noise and vibration emissions, BAT is to use one or a combination of the techniques given below: (a) Appropriate location of equipment and buildings; (b) Operational measures; (c) Low noise-equipment; (d) Noise and vibration equipment; (e) Noise attenuation	CC	<u>Environment Agency assessment</u> The operator has provided information to support compliance with BATc 18. We have assessed the information provided and we are satisfied that the operator has demonstrated compliance.
19	In order to optimise water consumption, to reduce the volume of waste water generated and to prevent or, where that is not practicable, to reduce	FC	<u>Environment Agency assessment</u> The operator has provided information to support compliance with BATc 19. We have assessed the information provided

BAT Conclusi on No	Summary of BAT Conclusion requirement for Waste Treatment	Status NA/ CC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
	emissions to soil and water, BAT is to use an appropriate combination of the techniques given below: (a) Water management; (b) Water recirculation; (c) Impermeable surface; (d) Techniques to reduce the likelihood and impact of overflows and failures from tanks and vessels; (e) Roofing of waste storage and treatment areas; (f) Segregation of water streams (g) Adequate drainage infrastructure; (h) Design and maintenance provisions to allow detection and repair of leaks (i) Appropriate buffer storage capacity		and we are satisfied that the operator has demonstrated compliance with BAT 19 except for points b and d in relation to water recirculation, and techniques to reduce the likelihood and impact of overflows and failures from tanks and vessels. We have included improvement condition IC15b to ensure the secondary containment proposals are suitable. We have included improvement condition IC27 to ensure the recirculation of water is adequately managed. Secondary containment design The Operator's report included a review of the design, method of construction and integrity of the site secondary containment and storage which was carried out by a structural or civil engineer. The review compared the existing site secondary containment against CIRIA C736. The report included a review of the: • physical condition of the secondary containment • the suitability for providing containment when subjected to the dynamic and static loads caused by catastrophic tank failure; • a preventative maintenance and inspection regime; • future work required to ensure compliance with the standards set out in CIRIA C736 or other relevant industry standard; and • Recommendations (where relevant) We assessed the Operator's assessment having regard to following guidance documents:

BAT Conclusi on No	Summary of BAT Conclusion requirement for Waste Treatment	Status NA/ CC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
			• CIRIA C736 Containment systems for the prevention of pollution • ADBA Industry Guide: Secondary Containment at AD Plants (Version 1, 2016); • ADBA PROJEN AD Containment Classification Tool We reviewed the Operator's report and its findings. We are not satisfied that the existing site containment meet the standards set out in CIRIA C736. We have set improvement conditions in the permit to address the deficiencies in the existing site secondary containment (IC15b). See Improvement conditions in Annex 3 of this decision document. Recirculation of water from food waste anaerobic digestion The operator has confirmed that centrate effluent otherwise known as food waste AD liquors from the post digestion centrifuge assets is partially recirculated with the remaining volume returned to the water recycling centre (WRC). The operator has not specified in their assessment the extent of recirculation versus discharge of the effluent back into the works, or provided evidence to demonstrate that the level of recirculation is effectively minimised to reduce the discharge of food waste effluent.

BAT Conclusi on No	Summary of BAT Conclusion requirement for Waste Treatment	Status NA/ CC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
			In line with the principles of BATc 19b and 35b relating to the recirculation of waste water we have therefore set improvement condition (IC27) which requires the operator to submit a report for approval to demonstrate how the generation of food waste AD liquors is minimised, to outline operational constraint preventing full recirculation and to describe the operational and management controls in to place in relation to water recirculation.
20	In order to reduce emissions to water, BAT is to treat waste water using an appropriate combination of the techniques given below: <i>Preliminary and primary treatment, e.g.</i> (a) Equalisation (b) Neutralisation (c) Physical separation, e.g. screens, sieves, grit separators, grease separators, oil-water separation or primary settlement tanks <i>Physico-chemical treatment, e.g.</i> (d) Adsorption (e) Distillation /rectification (f) Precipitation (g) Chemical oxidation (h) Chemical reduction (i) Evaporation (j) Ion exchange (k) Stripping <i>Biological treatment, e.g.</i>	FC	<u>Environment Agency assessment</u> See BATc 7 above.

BAT Conclusi on No	Summary of BAT Conclusion requirement for Waste Treatment	Status NA/ CC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
	(l) Activated sludge process (m) Membrane bioreactor (n) Nitrification / denitrification when the treatment includes a biological treatment Solids removal, e.g. (o) Coagulation and flocculation (p) Sedimentation (q) Filtration (e.g. sand filtration, microfiltration, ultrafiltration) (r) Flotation See also: Table 6.1: BAT-associated emission levels (BAT-AELs) for direct discharges to a receiving water body See also: Table 6.2: BAT-associated emission levels (BAT-AELs) for indirect discharges to a receiving water body		
21	In order to prevent or limit the environmental consequences of accidents and incidents, BAT is to use all of the techniques given below, as part of the accident management plan (see BAT 1): (a) Protection measures; (b) Management of incidental /accidental emissions; (c) Incident /accident registration and assessment system	CC	<u>Environment Agency assessment</u> The operator has provided information to support compliance with BATc 21. We have assessed the information provided and we are satisfied that the operator has demonstrated compliance.
22	In order to use materials efficiently, BAT is to substitute materials with waste.	CC	<u>Environment Agency assessment</u> The operator has provided information to support compliance with BATc 22. We have assessed the information provided

BAT Conclusi on No	Summary of BAT Conclusion requirement for Waste Treatment	Status NA/ CC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
	Waste is used instead of other materials for the treatment of wastes (e.g. waste alkalis or waste acids are used for pH adjustment, fly ashes are used as binders).		and we are satisfied that the operator has demonstrated compliance.
23	In order to use energy efficiently, BAT is to use both of the techniques given below: (a) Energy efficiency plan; (b) Energy balance record	CC	<u>Environment Agency assessment</u> The operator has provided information to support compliance with BATc 23. We have assessed the information provided and we are satisfied that the operator has demonstrated compliance.
24	In order to reduce the quantity of waste sent for disposal, BAT is to maximise the reuse of packaging, as part of the residues management plan (see BAT 1). Packaging (drums, containers, IBCs, pallets, etc.) is reused for containing waste, when it is in good condition and sufficiently clean, depending on a compatibility check between the substances contained (in consecutive uses). If necessary, packaging is sent for appropriate treatment prior to reuse (e.g. reconditioning, cleaning).	CC	<u>Environment Agency assessment</u> The operator has provided information to support compliance with BATc 24. We have assessed the information provided and we are satisfied that the operator has demonstrated compliance.
33	In order to reduce odour emissions and to improve the overall environmental performance, BAT is to select the waste input. The technique consists of carrying out the pre-acceptance, acceptance and sorting of the waste input (see BAT 2) so as to ensure the suitability of the waste input for the waste treatment, e.g. in terms of nutrient balance, moisture or toxic compounds which may reduce the biological activity.	CC	<u>Environment Agency assessment</u> The operator has provided information to support compliance with BATc 33. We have assessed the information provided and we are satisfied that the operator has demonstrated compliance.

BAT Conclusi on No	Summary of BAT Conclusion requirement for Waste Treatment	Status NA/ CC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
34	In order to reduce channelled emissions to air of dust, organic compounds and odorous compounds, including H₂S and NH₃, BAT is to use one or a combination of the techniques given below: (a) Adsorption; (b) Biofilter; (c) Fabric filter; (d) Thermal oxidation; (e) Wet scrubbing See also: Table 6.7: BAT-associated emission levels (BAT-AELs) for channelled NH₃, odour, dust and TVOC emissions to air from the biological treatment of waste.	FC	Environment Agency assessment We consider that the operator will be future compliant with BATc 34, as the permit has been updated to include emission limits and monitoring in accordance with BATc 34. We have set improvement conditions in the permit to assess the effectiveness of the existing abatement system (IC24b). See Improvement conditions in Annex 3 of this decision document. Effectiveness of existing abatement systems The installation includes industrial processes which produce waste gas and odour emissions that are discharged to air via vents or stacks. BAT conclusion 14 of the Waste Treatment BREF states that emissions from diffuse sources should use techniques like, <i>collecting and directing the emissions to an appropriate abatement system via an air extraction system and/or air suction systems close to the emission sources</i>. BAT conclusion 34 describes the use of appropriate techniques to reduce channelled emissions to air of dust, HCl, organic compounds and odorous compounds, including H₂S and NH₃. These are adsorption, biofilter, fabric filter, thermal oxidation and wet scrubbing. The abatement technique(s) employed at this installation are the gas to grid GAC biofilter and carbon OCU (emission A24), food waste biofilter (emission A30). The abatement system covers the following areas on site:

BAT Conclusi on No	Summary of BAT Conclusion requirement for Waste Treatment	Status NA/ CC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
			• Gas to grid system • Food waste reception hall The treated air stream is then discharged to atmosphere via a stack. We did not assess the operator's abatement plant and its suitability in providing effective abatement during the permit review. As part of the Environment Agency approach to reduce emissions in the biowaste treatment sector, we have set improvement condition (IC24b). The improvement condition requires the operator to demonstrate via determining the composition of waste gas emissions, monitoring and additional risk assessment that the existing abatement system effectively treats the emissions to air. Where further improvements are identified, the operator is required to implement these measures. It should be noted that a review of the existing system could determine that the existing systems are not suitable for the waste gas emissions. Where this is the case, further improvements on site may be required which may include the installation of new abatement plant. The installation of a new abatement plant will require a variation to the existing permit. Any new abatement plant will need to be designed to reduce odours and where required ammonia. For new abatement plant, an operator will need to ensure that new abatement systems achieve the BAT-AEL for odour or limits defined by the plant design, whichever is less. The BAT-AEL for odour concentration is 1,000 ouE/m³. Should the operator seek to

BAT Conclusi on No	Summary of BAT Conclusion requirement for Waste Treatment	Status NA/ CC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
			install an abatement system which cannot meet this requirement, it is unlikely that the abatement plant will be BAT.
35	In order to reduce the generation of waste water and to reduce water usage, BAT is to use all of the techniques given below: (a) Segregation of water streams; (b) Water recirculation; (c) Minimisation of the generation of leachate	FC	<u>Environment Agency assessment</u> The operator has provided information to support compliance with BATc 35. We have assessed the information provided and we are satisfied that the operator has demonstrated compliance with BAT 35 except for point b – water recirculation. We have included improvement condition IC27 is met to ensure the recirculation of water is adequately managed. Recirculation of water from food waste anaerobic digestion The operator has confirmed that centrate effluent otherwise known as food waste AD liquors from the post digestion centrifuge assets is partially recirculated with the remaining volume returned to the water recycling centre (WRC). The operator has not specified in their assessment the extent of recirculation versus discharge of the effluent back into the works, or provided evidence to demonstrate that the level of recirculation is effectively minimised to reduce the discharge of food waste effluent. In line with the principles of BATc 19b and 35b relating to the recirculation of waste water we have therefore set improvement condition (IC27) which requires the operator to submit a report for approval to demonstrate how the

BAT Conclusi on No	Summary of BAT Conclusion requirement for Waste Treatment	Status NA/ CC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
			generation of food waste AD liquors is minimised, to outline operational constraint preventing full recirculation and to describe the operational and management controls in to place in relation to water recirculation.
36	In order to reduce emissions to air and to improve the overall environmental performance, BAT is to monitor and/or control the key waste and process parameters. Monitoring and/or control of key waste and process parameters, including: • waste input characteristics (e.g. C to N ratio, particle size); • temperature and moisture content at different points in the windrow; • aeration of the windrow (e.g. via the windrow turning frequency, O₂ and/or CO₂ concentration in the windrow, temperature of air streams in the case of forced aeration); windrow porosity, height and width.	NA	<u>Environment Agency assessment</u> Applicability limited to aerobic treatment of waste.
37	In order to reduce diffuse emissions to air of dust, odour and bioaerosols from open-air treatment steps, BAT is to use one or both of the techniques given below: (a) Use of semi permeable membrane covers; (b) Adaptation of operations to the meteorological conditions	NA	<u>Environment Agency assessment</u> Applicability limited to the aerobic treatment of waste
38	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. This includes monitoring and/or control of key waste and process parameters:	CC	<u>Environment Agency assessment</u> The operator has provided information to support compliance with BATc 38. We have assessed the information provided and we are satisfied that the operator has demonstrated compliance. The permit also stipulates the monitoring of key waste and process control parameters.

BAT Conclusi on No	Summary of BAT Conclusion requirement for Waste Treatment	Status NA/ CC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
	• pH and alkalinity of the digester feed; • digester operating temperature; • hydraulic and organic loading rates of the digester feed; • concentration of volatile fatty acids (VFA) and ammonia within the digester and digestate; • biogas quantity, composition (e.g. H₂S) and pressure; liquid and foam levels in the digester.		
39	In order to reduce emissions to air, BAT is to use both of the techniques given below: (a) Segregation of the waste gas streams; (b) Recirculation of waste gas	NA	<u>Environment Agency assessment</u> Applicability limited to mechanical biological treatment

Annex 2: Review and assessment of changes that are not part of the BAT Conclusions derived permit review

Mothballed activities

Section 5.5 activity for the production of fuel pellets

In correspondence received from the operator on the 10 March 2026 the operator confirmed the Section 5.5 A(1) (a) *making solid fuel (other than charcoal) from waste by any process involving the use of heat* activity for fuel pellet production has been mothballed.

We have therefore set a pre-operational condition (PO1) for the operator to seek approval from the environment agency prior to re-commencement of that operation. Prior to approval being granted the operator will need to demonstrate how they will meet the requirements of pre-operational condition (PO1) which requires that the operator demonstrates how they will meet the requirements of the Waste Treatment BAT Conclusions and Non-hazardous and inert waste appropriate measures for permitted sites and other appropriate measures guidance as applicable.

We have made it clear that completion of the pre-operational condition would not preclude the necessity to submit a variation should onsite changes to that activity deviate in detail to the currently permitted version of the activity (for example a repositioning of associated emission points or a change to the DAAs, etc.). If the mothballed activity is not recommenced within a reasonable timescale the agency may compel the operator via compliance discussions and ongoing regulation to consider submitting a partial surrender of the activity.

Section 5.4 activity for the food waste AD

In correspondence received from the operator on the 14 May 2026. The operator confirmed that the S5.4 A(1) (b) (i) *Recovery or a mix of recovery and disposal of non-hazardous waste with a capacity exceeding 75 tonnes per day (or 100 tonnes per day if the only waste treatment activity is anaerobic digestion) involving biological treatment* activity for food waste AD has been mothballed for the next 2 years.

We have therefore set a pre-operational condition (PO2) for the operator to seek approval from the environment agency prior to re-commencement of that operation. Prior to approval being granted the operator will need to meet the requirements of pre-operational condition (PO2) which requires the operator to demonstrate how they will meet the requirements of the Waste Treatment BAT Conclusions and Biological waste treatment appropriate measures for permitted sites and other appropriate measures guidance as applicable.

This also requires the operator to explain how the food waste AD operation will interact with the other permitted activities on site if no longer mothballed, and carry out a H1 assessment and/or detailed modelling to establish and demonstrate the potential impact of emissions to air and water and a consideration to either redirect food waste centrate effluent flows away from sampling point S1 (the sludge waste AD liquors sampling point).

We have made it clear that completion of the pre-operational condition would not preclude the necessity to submit a variation should onsite changes to that activity deviate in detail to the currently permitted version of the activity (for example a repositioning of associated emission points or a change to the DAAs, etc.). This may include the necessity to submit a variation to provide an alternative sampling point for the sludge waste AD operation AR1 in the event that food waste centrate cannot be redirected away from sampling point S1. This is relevant in order to prevent double monitoring (food waste centrate is sampled at S5 prior to its arrival as S1) and to ensure sampling point S1 characterises sludge waste AD liquors only. If the mothballed activity is not recommenced within a reasonable timescale the agency may compel the operator via compliance discussions and ongoing regulation to consider submitting a partial surrender of the activity.

As part of this process we had already undertaken a partial assessment of the food waste operation under the Regulation 61 process. To ensure this is captured we have included this assessment in the permit and decision document below. This does not preclude the requirement to completed PO2 if the food waste activity is brought back into operation.

The Food soup operation also uses assets from the Food waste AD activity, this activity will need to meet the requirements of the [Biological waste treatment: appropriate measures for permitted facilities](#) from the point of permit issue.

Existing Medium Combustion Plant

Biogas generated through the AD of waste contains a high quantity of methane and is often used to provide energy to onsite operations. Biogas is commonly combusted within on-site combined heat and power engines (CHP) or boilers which produce heat and electricity. Heat is used to provide energy in the form of steam or hot water and is directed to the anaerobic digestion plant processes, while electricity can be utilised to power other plant on site.

Combustion of biogas or other fuels such as natural gas produces waste gas emissions which are discharged to the atmosphere via a stack. The combustion of biogas releases the following products of combustion; oxides of nitrogen (expressed as NO₂), sulphur dioxide (SO₂), carbon monoxide (CO) and volatile organic compounds (VOC).

We asked the Operator to provide information on all combustion plant on site in the Regulation 61 Notice as follows:

- Number of combustion plant (CHP engines, back-up generators, boilers);
- Size of combustion plant – rated thermal input (MWth)
- Date each combustion plant came into operation
- Confirmation as to whether or not the combustion plant is subject to a capacity market agreement (2014 or 2015 auction) or whether or not a Feed-in Tariff preliminary accreditation application was received prior to 1 December 2016

The Operator provided the information in the table below:

Combined heat and power (CHP) engines

1. Rated thermal input (MW) of the medium combustion plant.	5 x Combined heat and power – 3.636 MWth each
2. Type of the medium combustion plant (diesel engine, gas turbine, dual fuel engine, other engine or other medium combustion plant).	Engine
3. Type and share of fuels used according to the fuel categories laid down in Annex II.	Biogas
4. Date of the start of the operation of the medium combustion plant or, where the exact date of the start of the operation is unknown, proof of the fact that the operation started before 20 December 2018.	August 2022
5. Confirmation of capacity market agreement arising from 2014 or 2015 capacity auctions.	N/A
6. Confirmation of Feed-in Tariff preliminary accreditation application received by the Gas and Electric Markets Authority prior to 1 December 2016.	N/A

Boilers

1. Rated thermal input (MW) of the medium combustion plant.	1 x 4 MWth Boiler
2. Type of the medium combustion plant (diesel engine, gas turbine, dual fuel engine, other engine or other medium combustion plant).	Natural gas fired boiler
3. Type and share of fuels used according to the fuel categories laid down in Annex II.	Natural Gas
4. Date of the start of the operation of the medium combustion plant or, where the exact date of the start of the operation is unknown, proof of the fact that the operation started before 20 December 2018.	October 2016

5. Confirmation of capacity market agreement arising from 2014 or 2015 capacity auctions.	N/A
6. Confirmation of Feed-in Tariff preliminary accreditation application received by the Gas and Electric Markets Authority prior to 1 December 2016.	N/A

We consider the Black Start generator fuelled on diesel does not fall within the scope of MCPD due to the limited number of hours of operation (less than 50 per annum) as well as the 0.9MWth falling below the threshold for MCPD. We have included this plant as a point source emission to air in the permit with no monitoring requirements.

We have reviewed the information provided and we consider that the declared combustion plant qualify as “existing” medium combustion plant.

For existing medium combustion plant with a rated thermal input greater than 5 MW, the emission limit values set out in tables 2 and 3 of Part 1 of Annex II MCPD shall apply from 1 January 2025.

For existing MCP with a rated thermal input of less than or equal to 5 MW, the emission limit values set out in tables 1 and 3 of Part 1 of Annex II MCPD shall apply from 1 January 2030.

We have included the appropriate emission limit values for existing medium combustion plant as part of this permit review. See Table S3.1 in the permit.

We have included improvement condition IC21 in the permit which requires the Operator to assess methane slip resulting from the combustion of biogas via the CHP engines. Following an assessment of the data, the Environment Agency shall consider whether or not emission limits for volatile organic compounds are applicable for this installation.

Biogas upgrading plant

The operator submitted an assessment to consider the impact of air emissions from the biogas upgrading plant. The emissions of hydrogen sulphide and volatile organic compounds (VOCs) were screened out as insignificant, in that process contributions were <1% of the long term environmental standard (ES) and <10% of the short term ES. We conclude that emissions of hydrogen sulphide and VOCs are unlikely to have a significant impact on human health.

The emissions data (H₂S and VOCs) from the biogas upgrading plant were obtained from the manufacturer and not based on real-time operational monitoring data. We consider it appropriate to set an IC (IC20) which requires the operator to undertake a monitoring survey following the commencement of

operations at the biogas upgrading plant to obtain actual (real-time) operational monitoring data.

Improvement Condition (IC20) requires the operator to undertake an air emissions impact assessment (H1 software tool) using the results of the monitoring survey and compare the long and short term impacts of pollutants in accordance with the Environment Agency Guidance – *Air emissions risk assessment for your environmental permit*. Following the review of results from the monitoring survey and impact assessment, the Environment Agency shall consider whether emission limits are appropriate at emission point A24. We have used this approach for biowaste treatment facilities proposing to install biogas upgrading plants across England

Bioaerosols monitoring requirements

We asked the Operator to confirm the following aspects regarding the site operations in the Regulation 61 Notice:

- Whether or not the operational processes of biodegradable waste are in open processes within 250 metres of human receptors.
- Whether or not there is a channelled or point source release within 250 metres that are open sources e.g. biofilters within 250 metres of human receptors; and
- The existing permit contains bioaerosols monitoring requirements, the microbiological markers, associated bioaerosols limits and the monitoring standards

The Operator did not provide information regarding bioaerosols monitoring in their response to the Regulation 61 Notice.

We carried out an assessment of the site location and the distance of site processes from sensitive receptors as part of this determination. There are no external site operational processes and/or channelled /point sources within 250 metres of a sensitive receptor. Monitoring of bioaerosols is not required at the Installation.

Soil & groundwater risk assessment (baseline report)

The IED requires that the operator of any IED installation using, producing or releasing “relevant hazardous substances” (RHS) shall, having regarded the possibility that they might cause pollution of soil and groundwater, submit a “baseline report” with its permit application. The baseline report is an important reference document in the assessment of contamination that might arise during the operational lifetime of the regulated facility and at cessation of activities. It

must enable a quantified comparison to be made between the baseline and the state of the site at surrender.

At the definitive cessation of activities, the Operator has to satisfy us that the necessary measures have been taken so that the site ceases to pose a risk to soil or groundwater, taking into account both the baseline conditions and the site's current or approved future use. To do this, the Operator has to submit a surrender application to us, which we will not grant unless and until we are satisfied that these requirements have been met.

The Operator submitted a site condition report H5 SCR Wessex Water Avonmouth food WRC (version 01 – Sept 2022) accompanied by supporting documents; Ground investigation factual report (version 02 – Nov 2021); 2019 2020 and 2021 annual ground monitoring reports (all issue 1 – March 2019, 2020 and 2021); Geotechnical report (Feb 1998); Supporting information for the H5 site condition report (Sept 2022); ground investigation report (Dec 2021) submitted 30/09/2022. The site condition report included a report on the baseline conditions as required by Article 22. We reviewed that report and considered that it did not contain enough information or data to pinpoint specific areas relating to those in which operations have been carried out previously. The report recommends the collection of additional data to improve coverage, which we would welcome. Whilst the environmental setting and historic land use information in the SCR (2022) is still relevant and adequate, there have been several pollution incidents on-site since according to available compliance reports. These incidents were however in the currently permitted part of the site and since the permit will remain in place across those areas, incorporation of those details into the SCR would be advisable to facilitate a future surrender. It should be noted the SCR (2022) comments on the condition of pollution prevention measures and visual/olfactory evidence of contamination but these observations would now be out of date.

In conclusion, we would recommend the operator provide clarity surrounding the coverage of the SCR (2022) and baseline data with respect to the area to be permitted under this variation. Historical contamination is likely given the industrial use of the area. It would be recommended when it comes to permit surrender if the baseline data could be incorporated into a single document clearly showing the locations of samples and the concentrations of contaminants across the site.

Waste types

We have specified the permitted waste types, descriptions and quantities, which can be accepted at the regulated facility. The wastes are specified in Table S2.4 in the permit.

We are satisfied that the Operator can accept these wastes for the following reasons:

- they are suitable for the proposed activities

- the proposed infrastructure is appropriate
- the environmental risk assessment is acceptable.

Other wastes (non-standard waste codes)

Some of the wastes in the current permit have differing descriptions from those listed in the our revised biowaste treatment permit templates. We have retained these wastes in the current permit under the provision they are re-described in line with the biowaste permit template. The table below contains the original descriptions, the new descriptions can be seen in table S2.4 in the permit.

Waste code	Description
02 01 01	sludges from washing and cleaning – food processing waste, food washing waste
02 01 06	animal faeces, urine and manure (including spoiled straw) only
02 02 01	sludges from washing and cleaning – process water – food washing waste
02 02 03	materials unsuitable for consumption or processing – coffee, food processing waste, jam, kitchen waste, fruit, vegetable oil, tobacco, tea, vegetable waste – waste fat from processing of meat or fish
02 02 04	sludges from on-site effluent treatment
02 03 01	sludges from washing, cleaning, peeling, centrifuging and separation – coffee, mushroom compost, food processing waste, food washing waste, tobacco
02 03 04	biodegradable materials unsuitable for consumption or processing (other than those containing dangerous substances)
02 03 05	effluent from the process referred to in sources of waste
02 04 03	sludges from on-site effluent treatment – biological sludge
02 05 01	biodegradable materials unsuitable for consumption or processing (other than those containing dangerous substances) - solid and liquid dairy products, milk, food processing wastes, yoghurt, whey
02 06 01	biodegradable materials unsuitable for consumption or processing (other than those containing dangerous substances) - food condemned, food processing wastes, biscuits, chocolate, yeast, bread, bakery waste
02 06 03	sludges from on-site effluent treatment
02 07 01	wastes from washing, cleaning and mechanical reduction of raw materials – brewing waste, food processing waste, fermentation waste
02 07 02	wastes from spirit distillation – spent grains, fruit and potato pulp – sludge from distilleries
02 07 04	biodegradable materials unsuitable for consumption or processing (other than those containing dangerous substances) - brewing waste, food processing waste, fermentation waste, beer, alcoholic drinks, fruit juice
15 01 01	paper and cardboard packaging – must confirm to BS EN 13432 – no manmade substances. Only as packaging containing organic waste

Waste code	Description
15 01 03	wooden packaging – must conform to BS EN 13432. Only as packaging containing organic waste
15 01 05	composite packaging – must conform to BS EN 13432. Only as packaging containing organic waste
19 02 10	combustible wastes
19 06 03	liquor from anaerobic treatment of municipal waste
19 06 04	digestate from anaerobic treatment of source segregated biodegradable waste
19 06 05	liquor from anaerobic treatment of animal and vegetable waste
16 06 06	digestate from anaerobic treatment of animal and vegetable waste
19 08 12	sludges from industrial biological treatment
20 01 01	paper and cardboard – only as packaging containing organic waste
20 01 08	biodegradable kitchen and canteen waste
20 03 01	mixed municipal waste – separately collected biowastes

The operator voluntarily removed the following waste codes from the permit that were not included in the approved list within the biowaste permit review template. This was confirmed in correspondence received 13 August 2026.

Waste code	Description
03 03 10	Fibre rejects and sludges from paper pulp (de-inked only), paper fibre
03 03 11	Sludges from on-site effluent treatment not otherwise specified
04 01 01	fleshings and lime split wastes
19 05 01	non-composted fraction of municipal and similar wastes
19 05 02	non-composted fraction of animal and vegetable waste
19 05 03	off-specification compost from source segregated biodegradable waste
20 01 38	wood other than that mentioned in 20 01 37, and only where no non-biodegradable coating or preserving substance present – must conform to BS EN 13432

We made this decision with respect to waste types in accordance with the Framework Guidance Note – *Framework for assessing suitability of wastes going to anaerobic digestion, composting and biological treatment* (July 2013).

Secondary containment infrastructure design

We asked the Operator via the Regulation 61 Notice to:

- describe any secondary containment and whether it currently meets the relevant standard in the “Containment systems for the prevention of

- pollution (C736)" report, where there are above-ground storage or primary containment on site; or
- explain why the current site infrastructure design and construction is fit for purpose, where it is concluded that secondary containment is not required or does not need to meet the standards in the C736 report, to enable a baseline standard so as to establish a quantified comparison; and
- describe how the construction of the lagoons meets the relevant standard in CIRIA C736 report, where there are storage lagoons used for the storage of digestate on site.

Assessment of existing secondary containment design and construction

The Operator's report included a review of the design, method of construction and integrity of the site secondary containment and storage which was carried out by a structural or civil engineer. The review compared the existing site secondary containment against CIRIA C736. The report included a review of the:

- physical condition of the secondary containment
- the suitability for providing containment when subjected to the dynamic and static loads caused by catastrophic tank failure;
- a preventative maintenance and inspection regime;
- future work required to ensure compliance with the standards set out in CIRIA C736 or other relevant industry standard; and
- Recommendations (where relevant)

We assessed the Operator's assessment having regard to following guidance documents:

- CIRIA C736 Containment systems for the prevention of pollution
- ADBA Industry Guide: Secondary Containment at AD Plants (Version 1, 2016);
- ADBA PROJEN AD Containment Classification Tool

We reviewed the Operator's report and its findings. We are not satisfied that the existing site containment meet the standards set out in CIRIA C736.

We have set improvement conditions in the permit to address the deficiencies in the existing site secondary containment (IC15b). See Improvement conditions in Annex 3 of this decision document.

Uncontrolled biogas and waste gas emissions – open treatment or storage tanks relating to food waste AD

Anaerobic digestion is a biological treatment of waste which uses natural processes where microorganisms break down organic matter in the absence of

oxygen into biogas and digestate. Biogas has a varied composition but typically contains predominantly methane, carbon dioxide and nitrogen with traces of hydrogen sulphide and ammonia. Due to the methane component, biogas is combustible and has a significant global warming potential. In addition, fugitive emissions of biogas could also risk fire or explosion, as well as toxicity from gases such as hydrogen sulphide.

The Waste Treatment BREF and BAT conclusion 14 states:

In order to prevent or, where that is not practicable, to reduce diffuse emissions to air, in particular of dust, organic compounds and odour, BAT is to use an appropriate combination of the techniques...., as listed in the BAT Conclusion. An extract from the appropriate techniques listed in BAT Conclusion 14 for the prevention, or where that is not practicable, the reduction of diffuse emissions to air from open tanks is set out in Table 1 below.

Table 1			
Technique		Description	Applicability
d	Containment, collection and treatment of diffuse emissions	This includes techniques such as: • storing, treating and handling waste and material that may generate diffuse emissions in enclosed buildings and/or enclosed equipment (e.g. conveyor belts); • maintaining the enclosed equipment or buildings under an adequate pressure; • collecting and directing the emissions to an appropriate abatement system, via an air extraction system and/or air suction systems close to the emission sources.	The use of enclosed equipment or buildings may be restricted by safety considerations such as the risk of explosion or oxygen depletion. The use of enclosed equipment or buildings may also be constrained by the volume of waste.

BAT requires that waste stored which produces waste gases must be enclosed. Gases must then be appropriately abated or direct to the gas collection system. Section 2.3.5.5 of the Waste Treatment BREF states:

Because flaring is both a source of pollution and leads to the burning of a potentially valuable product, its use should be limited to non-routine, momentary stoppages or emergency releases. Uncontrolled emissions (especially VOCs) from vents and relief valves should be routed to recovery systems, with flares serving only as a backup system.

This section of the BREF is in reference to the flaring of biogas and not directly relevant to open tanks. However, it is important to stress that due to the pollution potential from uncontrolled emissions of biogas, it is essential that these

emissions are collected and utilised either as a fuel, in storage or for further treatment to refine the biogas. It is not appropriate to store or treat digestate producing biogas within open tanks.

We acknowledge that BAT conclusion 14d provides limits on the applicability for enclosing waste where there is a potential risk from explosion. Storage of unstable digestate will release unspecified quantities of combustible gases.

The Health and Safety Executive (HSE) provide general guidance on bulk storage tank design:

Design Codes – Plant

<https://www.hse.gov.uk/comah/sragtech/techmeasplant.htm>

Storage of flammable liquids in tanks

[Storage of flammable liquids in tanks HSG176 \(hse.gov.uk\)](#)

We have been advised that, in the view of the HSE, the competent installation of tank covers is possible using current tank standards. We believe it is possible to design and modify tanks that meet both the specific circumstances and relevant engineering standards.

We also recognise that the covering of tanks may have an impact on whether the site needs to consider the requirements of the Control of Major Accident Hazards (COMAH) Regulations 2015. The creation of additional enclosed space(s) in the site (inside the newly enclosed tanks and any associated new abatement equipment) where dangerous substances are present (or anticipated to be present) would have the consequence of increasing the COMAH inventory, which could in turn move a site from *Lower* to *Upper* Tier or bring a site into the scope of the regulations. An operator will need to consider these requirements when producing plans and designs for tank covers.

The Environment Agency considers the covering of tanks generating biogas (and channelling the gas to utilisation plant/storage) as BAT. It must be undertaken by any operators treating waste via anaerobic digestion (and subsequent storage). Any alternative approach to this must form part of a permit application supported by evidence-based justifications.

This installation currently uses two mesophilic anaerobic digesters (MADs) for the food waste AD to undertake anaerobic digestion. The site's annual throughput of waste treated via anaerobic digestion is 70,000 tonnes for the food waste AD. The waste undergoes this treatment in these tanks with a Hydraulic Retention Time (HRT) of 18-30 days in the MADs for food waste. HRT is defined as the working volume of the digester divided by the rate of feeding as volume per unit time and is expressed in days. It is a fundamental design parameter and is typically a determining factor in sizing the AD plant. Biogas produced during this stage is collected in the roof space of digestion

tanks and the standalone biogas holder and subsequently channelled via sealed pipework to gas utilisation structures which are shared between the two AD activities. This site uses five Combined Heat and Power (CHP) engines to combust the biogas to use the energy generated on site.

The treated waste, described as food digestate is discharged into the post digestion storage tank and strain press buffer tank from the food waste digesters. These tanks/assets are uncovered, therefore, any waste gases, including biogas will be emitted from the tank/assets to atmosphere.

We asked the operator to provide written confirmation that they will commit to covering the post digestion storage tank and strain press buffer tank from the food waste digesters and a description that shows the tank/asset enclosure will be in line with guidance, *Biological waste treatment: appropriate measures for permitted facilities*. We also asked how biogas generated from the post digestion storage tank and strain press buffer tank will be utilised as a fuel or stored for utilisation off site.

While the operator did not provide detailed proposals to enclose tanks, they have committed to develop plans to put these infrastructure changes in place to prevent uncontrolled emissions of biogas from open tanks in the near future.

To ensure the operator implements these changes, we have set an improvement condition (IC17b) to capture the gases produced within the post digestion storage tank and strain press buffer tank. The IC requires the tanks to be enclosed and connected to the gas management infrastructure, or in rare cases, to a suitable odour abatement system which treats the potentially polluting components of the waste gas. We state that an odour abatement system will only be suitable in rare cases because without evidence to demonstrate otherwise, these tanks and storage infrastructure likely continuously emit a methane rich gas to the environment. It is unlikely that emissions will be comprised of gases which can be controlled by traditional odour abatement techniques. It is therefore most likely that the operator will need to capture and use the gas or treat for the purpose of producing a viable biomethane.

The methane component of a biogas will not be treated by odour abatement techniques and will be discharged into the atmosphere. Only if methane is not a relevant component in the waste gas will odour abatement plant be justified for use on the post digestion storage tank and strain press buffer tank from the food waste digesters.

This improvement condition does not allow the operator to determine that the open tanks can remain uncovered. The improvement condition is not an opportunity for the operator to propose alternative methods to enclosing tanks, capturing gases and treating/using the gas.

The operator did not propose an appropriate alternative to the BAT technique of enclosing their tanks with any supporting evidence. The operator is therefore required to enclose the post digestion storage tank and strain press buffer tank from the food waste digesters.

IC17b requires the operator to produce a 'post anaerobic digestion vessel cover plan'. The plan requires the operator to include detailed design information on tank cover design and associated biogas gas management infrastructure (or in rare cases waste gas abatement plant). In addition to the design requirements, the operator must present appropriate evidence that the waste gases will be controlled by the proposed design. The operator has confirmed their commitment to enclosing these tanks and to the requirements of the improvement condition.

The permit also includes bespoke permit conditions alongside the ICs. This bespoke permit condition requires the operator to have the appropriate infrastructure installed on the site by 31 March 2030. Should the operator fail to implement the changes required by that deadline, the Environment Agency may undertake enforcement proceedings against the operator. This position is in place to facilitate the opportunity for operators to become BAT compliant and install necessary infrastructure. The Environment Agency recognises that this approach is different to standard environmental permitting processes. However, we consider that the operator has provided sufficient commitment that they will undertake the necessary improvements to prevent uncontrolled biogas emissions and/or other waste gas emissions from open tanks. Backstop conditions in the permit will ensure this is achieved.

Indirect emissions of waste water from the food waste AD

AD installations produce a series of liquid wastes. These waste waters (also known as 'liquid digestate' or 'liquors') are discharged to the adjacent WwTW. As explained at the start of this document, WwTW are regulated under separate legislation, the UWWTR and does not form part of this installation. The discharge of waste waters to the WwTW is therefore a point source emission and classed under the Waste Treatment BREF as an indirect emission to water.

Description of waste water discharge from the food waste AD

Effluent is generated on site through the hammermill and separation of fibrous waste from liquid fraction prior to the anaerobic digestion process, the dewatering of digestate following the anaerobic digestion process, the production of biogas condensate, biogas pipeline transfer, digestate transfer, centrifugation and post-digestion storage.

Operators of an installation must establish and maintain inventories, including information about the characteristics and composition of waste waters in accordance with BAT conclusion 3 of the Waste Treatment BREF. BAT conclusion 3 states:

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 which are identified for waste water as:

Information about the characteristics of the waste water streams, such as:

- *average values and variability of flow, pH, temperature, and conductivity;*
- *average concentration and load values of relevant substances and their variability (e.g. COD/TOC, nitrogen species, phosphorus, metals, priority substances / micropollutants);*
- *data on bioeliminability (e.g. BOD, BOD to COD ratio, Zahn-Wellens test, biological inhibition potential (e.g. inhibition of activated sludge))*

The operator did not have this data as part of the review. The Environment Agency recognises that the operator's emissions discharged to the WwTW have never been fully quantified, and therefore, accept that emissions to the WwTW have not been subject to a quantitative risk assessment.

We have therefore included improvement condition IC26 which requires the operator to submit and carry out a sampling and analysis program and gather the relevant data on the waste water. In accordance with the Waste Treatment BREF, the IC requires the operator to fully characterise the emission to water to establish a waste water inventory and undertake a full assessment of the results providing a summary of the sample results, a completed H1 risk assessment(s) and detailed modelling (where necessary). We also require the operator to submit proposals and/or additional measures required to prevent or minimise any significant emissions from the installation along with timescales for implementation.

The operator has provided written confirmation that it will initiate a sampling programme to determine the composition of the waste water at sampling point S5. They have also confirmed that sampling point S5 is directed to the WwTW via sampling point S1, which is the sampling point used to monitor the Sludge

waste AD. We have advised the operator that waste water from S5 will need to be redirected to WwTW away from S1, or alternatively the sampling point S1 amended to not include the sludge AD effluent with new sampling points confirmed in subsequent variation for the characterisation of those waste waters. This is to prevent the results from monitoring being unduly influenced by the waste water from a separate AD operation which would prevent accurate characterisation of emissions. We have tied this provision in with pre-operational condition PO2 to ensure this is carried out prior to the recommencement of the food waste AD.

Recirculation of water from food waste anaerobic digestion

The operator has confirmed that centrate effluent otherwise known as food waste AD liquors from the post digestion centrifuge assets is partially recirculated with the remaining volume returned to the water recycling centre (WRC). The operator has not specified in their assessment the extent of recirculation versus discharge of the effluent back into the works, the methodology for determining the level of recirculation or how they effectively minimise the discharge of food waste effluent.

In line with the principles of BATc 19b and 35b relating to the recirculation of waste water we have therefore set improvement condition (IC27) which requires the operator to submit a report for approval to demonstrate how the generation of food waste AD liquors is minimised, to outline operational constraint preventing full recirculation and to describe the operational and management controls in place in relation to water recirculation.

Review of emissions from digestate in riser pipes and the limpet box overflow chambers for food waste AD

The Environment Agency recognise that tanks were constructed prior to the current permitting requirements and their design may not be compatible with BAT as described in the relevant BREF documents. To facilitate the physical filling operation of digestate containing vessels many WaSCs have incorporated limpet chamber boxes and riser pipes as part of the methodology for how vessels are filled and emptied. During determination we have asked the operator to identify all limpet chamber boxes as point sources.

In accordance with sections 11.8 (Point source (diffuse) emissions to air) and 11.9 (Leak detection and repair) of *Environment Agency guidance, Biological waste treatment: appropriate measures for permitted facilities* we have set improvement condition (IC22b), which requires the operator to submit a report to quantify the emission releases from the riser pipes and limpet box chambers using leak detection reporting methodology and to outline a programme of works to minimise the release of diffuse emissions to periods during fill and spill

only or to consider replacement with a sealed system to achieve fill and spill without giving rise to diffuse emissions via the riser pipes and limpet chamber boxes (i.e. an alternative sealed pumping system).

Primary containment for food waste AD

We recognise that many sludge storage and treatment vessels were constructed prior to the current permitting requirements and their design may not be compatible with BAT as described in the relevant BREF documents. The operator provided an inventory of their tanks and described the condition of those assets. Comprehensive evidence was not provided to assess the condition of the tanks and determine whether they are suitable for containing potentially polluting wastes and waste waters. However, as these tanks are already existing and perform an ongoing industrial operation, we have set an improvement condition in the permit to address any potential deficiencies in the existing site's primary containment.

IC18b requires the operator to review (undertaken by an appropriately qualified engineer) the physical condition of the primary containment and establish a program of works to implement any necessary individual measures to ensure that the primary containment is fit for purpose. The Environment Agency will review these submissions with regard to the guidance, *CIRIA C736 Containment systems for the prevention of pollution*.

Effectiveness of abatement systems associated with food waste AD and shared gas infrastructure

The installation includes industrial processes which produce waste gas and odour emissions that are discharged to air via vents or stacks. BAT conclusion 14 of the Waste Treatment BREF states that emissions from diffuse sources should use techniques like, *collecting and directing the emissions to an appropriate abatement system via an air extraction system and/or air suction systems close to the emission sources*. This installation includes the storage and treatment of wastes in tanks and vessels. To prevent diffuse emissions of pollutants such as odour and ammonia, emissions are extracted and treated by an air abatement system. The abatement technology used at Avonmouth BC is combination of biofilters and carbon adsorption units. The treated air stream is then discharged to atmosphere via a stack.

As part of the determination we reviewed the operator's abatement plant and its suitability in providing effective abatement of diffuse air emissions and can confirm the existing air abatement systems represent techniques as identified in BAT conclusion 34.

Additionally, to verify whether existing measures have been effective and adequate to prevent and/or minimise emissions released to air, we have set improvement condition (IC24b). The improvement condition requires the

operator to demonstrate via determining the composition of waste gas emissions, monitoring and additional risk assessment that the existing abatement system effectively treats the emissions to air. Where further improvements are identified, the operator is required to implement these measures. It should be noted that a review of the existing system could determine that the existing systems are not suitable for the waste gas emissions. Should a review identify that a new abatement system is required, the improvement condition indicates that a variation application is needed.

Any new abatement plant should be designed to reduce odours and where required ammonia. For new abatement plant, an operator will need to ensure that new abatement systems achieve the BAT AEL for odour or limits defined by the plant design, whichever is less. The BAT AEL for odour concentration is 1,000 ouE/m³. Should the operator seek to install an abatement system which cannot meet this requirement, it is unlikely that the abatement plant will be BAT.

Annex 3: Improvement Conditions for food waste AD and gas infrastructure

Based on the information in the Operator's Regulation 61 Notice response and our own records of the capability and performance of the installation at this site, we consider that we need to set improvement conditions so that the outcome of the techniques detailed in the BAT Conclusions are achieved by the installation. These improvement conditions are set out below - justifications for them is provided at the relevant section of the decision document (Annex 1 or Annex 2).

If the consolidated permit contains existing improvement conditions that are not yet complete or the opportunity has been taken to delete completed improvement conditions then the numbering in the table below will not be consecutive as these are only the improvement conditions arising from this permit variation.

Improvement programme requirements		
Reference	Requirement	Date
Improvement condition for secondary containment design in relation to activity AR3		
IC15b	The operator shall submit a written 'secondary containment implementation plan' and shall obtain the Environment Agency's written approval to it. The plan shall contain the finalised designs and an implementation schedule for the identified secondary containment systems proposed in the document Avonmouth renewable energy site secondary containment report (version 2 – Nov 2025). The detailed design(s) and specifications shall be produced by appropriate competent individuals (qualified civil or structural engineer), in accordance with the risk assessment methodology detailed within CIRIA C736 (2014) guidance. The plan shall include but not be limited to the following components: An updated BAT assessment with specific regard to BAT 19 of the Waste Treatment BREF to demonstrate how the finalised designs based on the proposed secondary containment in the documents CIRIA 736 IED report - secondary containment assessment (version 2 – Dec 2023) and Avonmouth renewable energy site secondary containment report (version 2 – Nov 2025) meets BAT 19.	Implementation of all required and approved containment improvements must be completed prior to the recommencement of operations following the approval of pre-operational condition PO2

Improvement programme requirements		
Reference	Requirement	Date
	- An assessment of the suitability for providing containment when subjected to the dynamic and static loads caused by catastrophic tank failure. - Finalised designs and specifications of the proposed secondary containment proposal completed by appropriate competent individuals. - A program of works with timescales for the commissioning of the secondary containment systems to comply with CIRIA C736 (2014) guidance, or equivalent. - An updated site and infrastructure plan. - A preventative maintenance and inspection regime. The plan shall be implemented in accordance with the Environment Agency's prior written approval.	
Improvement conditions for enclosure of tanks storing (or treating) digestate for activity AR3		
IC17b	The operator shall submit a written 'post anaerobic digestion vessel cover' plan and obtain the Environment Agency's written approval to it. The plan shall contain the final designs and an implementation schedule for the installation of covers for vessels storing and/or treating digestate in tanks identified as the post digestion storage tank and strain press buffer tank relating to activity AR3. The plan shall also contain a detailed description of the proposed gas utilisation/abatement plant, gas storage infrastructure for the biogas produced during anaerobic digestion, pressure relief valves and gas pipework. The plan shall include but not be limited to the following components: - Evidence that the pollutants of the waste gas (including methane) produced in post digestion storage tank and strain press buffer tank will be controlled and/or abated either by the proposed gas utilisation plant or proposed abatement system. - Evidence that the vessel covers, gas utilisation/abatement plant and ancillary equipment have been designed by appropriately qualified engineers. - Evidence that the vessel covers, and gas utilisation/abatement plant will be designed and installed in accordance with guidance, <i>Biological</i>	Implementation of all required and approved vessel cover improvements must be completed prior to the recommencement of operations following the approval of pre-operational condition PO2

Improvement programme requirements		
Reference	Requirement	Date
	<u>waste treatment: appropriate measures for permitted facilities.</u> • An updated Hazard and Operability Study (HAZOP) and DSEAR risk assessment. • An assessment of gas storage capacity and gas utilisation/abatement capacity including proposals for additional gas utilisation/abatement plant. • A program of works with timescales for the commissioning of the vessel cover(s), gas utilisation/ abatement infrastructure and ancillary equipment. The plan shall be implemented in accordance with the Environment Agency's prior written approval. (i) (Note that approval of reports under this improvement condition does not preclude the need for permit variation applications to implement the improvements identified in the report. Any variation may include the insertion of necessary emission limit values).	
Improvement conditions for primary containment tanks relating to AR3		
IC18b	The operator shall submit a written 'primary containment plan' and shall obtain the Environment Agency's written approval to it. The plan shall contain the results of an inspection and program of works undertaken by an appropriately qualified engineer and shall assess the extent, design specification and condition of primary containment systems (including associated pipework) where polluting liquids and solids are being stored, treated, and/or handled. The plan shall include, but not be limited to: • An assessment of the physical condition of all primary containment systems (storage and treatment vessels and associated pipework) using a Written Scheme of Examination and their suitability for providing primary containment when subjected to dynamic and static loads. • A program of works with timescales for the implementation of individual improvement measures necessary to demonstrate that the primary containment is fit for purpose or	Within 12 months of completion of preoperational condition PO2 or such other date as agreed in writing with the Environment Agency

Improvement programme requirements		
Reference	Requirement	Date
	alternative appropriate measures to ensure all polluting materials will be contained on site. • A preventative maintenance and inspection regime. The plan shall be implemented in accordance with the Environment Agency's written approval.	
Improvement conditions for biogas upgrading plant		
IC20a	The operator shall carry out a monitoring study to verify the assumptions made in the application in relation to the releases of pollutants to air. The study shall include the monitoring of point source releases to air from the biogas upgrading plant emission points A24 during normal operation, having regard to the Environment Agency technical guidance, <i>Monitoring stack emissions: environmental permits</i> and to MCERTS standards. As a minimum, two separate monitoring campaigns in a year shall be completed (one monitoring survey six months following commissioning of the biogas upgrading plant). The pollutants to be monitored shall include: • Total volatile organic compounds. • Hydrogen sulphide.	Within 6 months of issue of this permit or such other date as agreed in writing with the Environment Agency
IC20b	Following the completion of IC20a, the operator shall undertake an emissions impact assessment of point source releases to air from points A24 using the information obtained through the emissions monitoring. The emissions impact assessment report and all associated monitoring reports and assessments shall be submitted in writing to the Environment Agency for review. The emissions impact assessment shall, as a minimum, include: • Reports showing details of the monitoring undertaken and the results obtained. • Results of the assessment of long and short-term impacts from the emissions in accordance with Environment Agency Guidance – Air emissions risk assessment for your environmental permit.	Within 6 months of completion of IC20a or such other date as agreed in writing with the Environment Agency

Improvement programme requirements		
Reference	Requirement	Date
	A completed H1 assessment software tool. If the H1 assessment shows potential long or short-term impacts from the emissions, the operator shall propose an action plan to reduce the impacts of the substances identified.	
Improvement condition to address methane slip emissions from gas engines burning biogas		
IC21	The operator shall submit a written plan for approval by the Environment Agency which establishes the methane emissions in the exhaust gas from engines burning biogas and or biomethane and compare these to the manufacturer's specification and benchmark levels. Where manufacturer's data is not available, operators should calculate a default benchmark level based on the TVOC emission limit of 1000mg/Nm³ specified within guidance, <u>Monitoring landfill gas engine emissions: LFTGN 08</u>. The plan shall develop proposals to assess the potential for methane slip and take corrective actions where emissions of methane above the manufacturer's specification are identified. The operator shall establish methane emissions in the exhaust gas and methane slip using the following standards: - EN ISO 25139 - EN ISO 25140	Within 6 months of issue of this permit or as such other agreed in writing with the Environment Agency
Improvement condition for review of emissions from digestate in riser pipes and the limpet box overflow chambers in relation to activity AR3		
IC22a	The operator shall submit a written 'limpet chamber review' report and shall obtain the Environment Agency's written approval to it. The report shall contain the results of an inspection and program of works undertaken by an appropriately qualified engineer and shall assess the design specification, condition and suitability of limpet chamber utilisation on digesters where there is a risk of uncontrolled emission release during periods of digester fill and spill. The report shall review the limpet chambers in line with the criteria set out in section 11.6 (Point source emission	Within 6 months of completion of preoperational condition PO2 or such other date as agreed in writing with the Environment Agency

Improvement programme requirements		
Reference	Requirement	Date
	to air – Stacks and vents) and 11.9 (Leak detection and repair) of Environment Agency guidance, <i>Biological waste treatment: appropriate measures for permitted facilities</i>. The report shall also include, but not be limited to: • A quantification of the emission releases from the limpet chambers using leak detection reporting methodology (emission estimate in kg/h for each chamber surveyed and total site emission rate in kg/h, including uncertainty). • A program of works with timescales for the implementation of identified individual improvement measures necessary to demonstrate that the limpet chambers are fit for purpose and operated to ensure emission release is minimised and only from digestate in the limpet box riser pipes and digestate in the limpet box overflow chamber. A preventative maintenance and inspection regime. The report shall be implemented in accordance with the Environment Agency's written approval.	
Improvement condition for review of effectiveness of abatement plant in relation to activity AR3 and AR15		
IC24b	The operator shall carry out a review of the abatement plant gas to grid GAC biofilter and carbon OCU (emission point A24), food waste biofilter (emission point A30) to determine whether the measures have been effective and adequate to prevent, or where this is not possible to minimise, emissions released to air (including but not limited to odour and ammonia). The operator shall submit a written report to the Environment Agency following this review for assessment and approval. The report shall include but not be limited to the following aspects: • Full investigation and characterisation of the waste gas streams. • Evidence that the emission of pollutants in the waste gas stream is being prevented or where this is not possible minimised by the abatement plant.	Within 6 months of permit issue or other date as agreed in writing with the Environment Agency

Improvement programme requirements		
Reference	Requirement	Date
	- Abatement stack monitoring results (including but not limited to odour and ammonia) - Abatement process monitoring results (including but not limited to odour and ammonia), - Details of air quality quantitative impact assessment including modelling and a proposal for site-specific “action levels” (including but not limited to odour concentration). - Odour monitoring results at the site boundary. - Records of odour complaints and odour related incidents. - Recommendations for improvement including the replacement or upgrading of the abatement plant. - Timescales for implementation of improvements to the abatement plant. The operator shall implement any improvements in line with the timescales as approved by the Environment Agency. (Note that approval of reports under this improvement condition does not preclude the need for permit variation applications to implement the improvements identified in the report. Any variation may include the insertion of necessary emission limit values).	
Improvement condition for establishing an inventory of liquid waste water discharged from food waste anaerobic digestion and associated activities (AR3 – AR13)		
IC26	The operator shall submit a written report to the Environment Agency for assessment and written approval as required by sections 11.2 and 11.12 of biological waste treatment: appropriate measures for permitted facilities. The emissions inventory must include information about the relevant characteristics of point source emissions to water. The sampling programme shall be designed to fully characterise the waste waters discharged to Avonmouth water recycling centre (WRC) from emission points S5 in table S3.2 of this permit. The report must include:	Within 12 months of completion of preoperational condition PO2 or such other date as agreed in writing with the Environment Agency

Improvement programme requirements		
Reference	Requirement	Date
	(a) the results and conclusions of the emissions monitoring and assessment undertaken in accordance with your emissions inventory. (a) the results and conclusions from an assessment of the environmental impact of the emissions to water using all relevant parameters identified from your emissions inventory under (a) above. The assessment must be carried out using the Environment Agency's 'H1 Environmental Risk Assessment' tool (or equivalent as agreed with the Environment Agency) and/or modelling as required following our guidance Surface water pollution risk assessment for your environmental permit' Where it is concluded that the impact of an emission may be significant or exceeds an environmental standard (e.g. an environmental quality standard EQS) the operator shall: a) Review whether there is a need for emissions limits in order to prevent exceedance of environmental standards. b) Propose revised emission limits that will prevent exceedance of the environmental standard(s) c) Include proposals for measures to mitigate the emission to meet the relevant emission limit (for example, the provision of additional treatment or abatement) and timescales for the implementation of these measures. The proposals shall be implemented within 6 months of approval of the report or as agreed in writing by the Environment Agency.	
Improvement condition for the recirculation of water from food waste anaerobic digestion and associated activities (AR3 – AR13)		
IC27	The operator shall submit a written 'Waste water reduction plan' for approval by the Environment Agency. The plan shall include a review of the generation, management and disposal of process waters from AR3 at point S5. The plan shall include, but not be limited to: • An assessment of how the generation of Food Waste AD liquors is minimised and managed within the installation, including the extent of recirculation within the process in line with BAT 19b and BAT 35b of the Best available	Within 3 months of completion of preoperational condition PO2 or such other date as agreed in writing with the Environment Agency

Improvement programme requirements		
Reference	Requirement	Date
	techniques as described in the BAT Reference Document for Waste Treatment (the BREF) and BAT conclusions; • A full explanation of any constraints on full recirculation, where applicable, including process or operational considerations; • A description of the operational and management controls in place to minimise pollution prior to transfer of liquors beyond the installation boundary; • Identification of any improvements required to ensure compliance with BAT 19b and 35b, including measures to reduce reliance on discharge of process waters to sewer; • A programme of any identified improvements, including timescales, to implement any measures identified. (ii) Any improvements shall be implemented within 6 months of approval of the report or as agreed in writing by the Environment Agency.	

Annex 4: Pre-operational Conditions

Pre-operational measures for future development		
Reference	Operation	Pre-operational measures
Pre-operational condition to submit an assessment of an activity prior to recommissioning		
PO1	Activity reference AR2 and associated waste types table S2.3. (chargeable pre-operational condition)	Prior to the recommencement of AR2 authorised by table S1.1, including any waste acceptance, storage and treatment which are temporarily non-operational under this variation notice, the operator shall confirm to the Environment Agency the intention to recommence operation and provide supporting documents for approval demonstrating activities are in accordance with the requirements of the Waste Treatment BAT Conclusions and Non-hazardous and inert waste appropriate measures for permitted sites and other appropriate measures guidance as applicable. The activities permitted shall only recommence once written agreement has been provided by the Environment Agency.
PO2	Activity reference AR3 and associated waste types table S2.4. (chargeable pre-operational condition)	Prior to the recommencement of AR3 authorised by table S1.1, including any waste acceptance, storage and treatment which are temporarily non-operational under this variation notice, the operator shall confirm to the Environment Agency the intention to recommence operation and provide supporting documents for approval demonstrating activities are in accordance with the requirements of the Waste Treatment BAT Conclusions and Biological waste treatment appropriate measures for permitted sites and other appropriate measures guidance as applicable. This shall also include; • How this operation will interact with the other operations/activities on-site. • A H1 assessment/detailed modelling (if required) looking at the potential impact of emissions from the food waste AD process, together with any measures to reduce or abate emissions where detailed modelling does not screen out such emissions. This will be applicable both to emissions to air and water.

Pre-operational measures for future development		
Reference	Operation	Pre-operational measures
Pre-operational condition to submit an assessment of an activity prior to recommissioning		
		How the centrate generated as part of the food waste AD liquors are directed to Avonmouth WRC via sampling point S5 without the effluent being also included in the monitoring of sampling point S1. This is to prevent double monitoring and to ensure sampling point S1 characterises sludge waste AD liquors only. If the effluent cannot be redirected accordingly a variation will be necessary to identify alternative sampling and transfer points prior to discharge into the works this may also include a variation to sludge AD activity AR1. Once approved the operator must implement the proposals in the report in line with the timescales agreed with the Environment Agency's written approval. The activities permitted shall only recommence once written agreement has been provided by the Environment Agency. (Note that approval of proposals under this pre-operational condition does not preclude the need for a permit variation application to recommission the activity in the case of any changes to that activity from what is already covered in this permit. Any variation may include the insertion of necessary emission limit values).

Annex 5: Document recording our decision-making process following the requirement for waste and wastewater sewerage treatment activities permitted as an installation subject to Chapter II of the Industrial Emissions Directive under the Environmental Permitting (England & Wales) Regulations 2016 (as amended)

We have decided to grant the variation for Avonmouth Bioresources Centre operated by Wessex Water Services Limited.

The permit variation number is EPR/PP3734LK/C015

The variation application EPR/PP3734LK/C015 includes the following:

- The consolidation of permit EPR/UP3797EA which is a standard rules 2008 No19.
- An application to bring existing operations into regulation including the addition of :
 - An installation activity for a S5.4 A(1) (b) (i) Recovery or a mix of recovery and disposal of non-hazardous waste with a capacity exceeding 100 tonnes per day involving biological treatment relating to the anaerobic digestion of sludges produced by the WwTW.
 - A food soup waste operation activity
 - A dewatering of sludge waste operation activity

Note: this section does not include the assessment and mothballing of food waste anaerobic digestion process (AR3), the mothballing of the fuel pelletisation section 5.5 activity (AR2) or the assessment of the processes associated with the shared gas infrastructure beyond that of the sludge AD headspace (such as the biogas upgrading plant and methane slip from the combined heat and power plants) as these have been addressed in the regulation 61 sections above. It should be noted that the combustion assets which include the five combined heat and power plants, boiler, emergency generator, two emergency flares and biomethane upgrade plant are shared assets between the food waste AD and sludge AD.

We consider in reaching this decision that 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.

This decision document provides a record of the decision-making process. It:

- summarises the decision making process in the decision considerations section to show how the main relevant factors have been taken into account
- highlights key issues in the determination
- shows how we have considered the consultation responses

Unless the decision document specifies otherwise, we have accepted the operator's proposals.

This permitting decision should be read in conjunction with the environmental permit.

Key issues of the decision

Best Available Techniques (BAT)

Article 3(12) of the IED defines BAT conclusions as:

a document containing the parts of a BAT reference document [BREF] laying down the conclusions on best available techniques, their description, information to assess their applicability, the emission levels associated with the best available techniques, associated monitoring, associated consumption levels and, where appropriate, relevant site remediation measures.

The *emission levels associated with the best available techniques* (BAT-AELs) in IED BAT conclusions are mandatory emission levels. These are generally numerical limits on point source emissions to water and air. We recognise that many sludge treatment facilities were constructed prior to the current permitting requirements and their design may not be readily compatible with the best available techniques as described in the BREF and BAT conclusions. Where this is the case, risk assessments and alternative proposals can be used to demonstrate that an equivalent level of environmental protection is being or can be achieved. Where an operator is not yet compliant with relevant BAT conclusions, we may accept an application where the operator describes how they will meet the required BAT conclusion within an acceptable timeframe. The Waste Treatment (2018) BREF provides a minimum standard of operation across the waste industrial sector. Alongside BAT-AELs, the BREF outlines general BAT conclusions, which apply to all waste sectors. It also contains BAT conclusions specifically for waste sectors which waste water treatment works operate within, namely; the biological treatment of waste and the treatment of water-based liquid wastes.

Wessex Water Services Limited (referred to in this document as the 'operator') provided supporting information with their application to demonstrate that their methods of operating are in accordance with the relevant BAT conclusions. We have assessed these documents. In this *Key issues* section, we provide a commentary of the following areas which helped determine how the operator will operate in accordance with the relevant BAT conclusions:

- Secondary containment (BAT conclusion 19)
- Minimise diffuse emissions to air (BAT conclusion 14)
- Inventory of waste waters (BAT conclusion 3)
- Point source emissions to water – indirect emissions (BAT conclusions 7 and 20)
- Odour management (BAT conclusion 12)

Where this document does not discuss a BAT conclusion in detail, we have accepted the operator's supporting information and justifications that they are compliant with the respective BAT conclusion.

Bespoke permit conditions

The technical determination of this application identified key issues where the operator struggled to show how they would meet the relevant BAT conclusion requirements. These are standard pieces of information and evidence which would be expected upon receipt of a new bespoke permit application for a new anaerobic digestion installation facility. In this application, we identified that the operator was unable to provide detailed supporting evidence that key issues would achieve BAT conclusion requirements. These key issues were:

- Sufficient secondary containment measures (permit conditions 3.2.3 and 3.2.4).
- Enclosure of waste storage tanks (permit conditions 3.2.5 and 3.2.6).
- Enclosure of tanks storing and treating digestate still generating biogas (permit conditions 3.2.7 and 3.2.8).

We have performed an assessment of these aspects during the permit determination. A detailed account of these assessments is outlined in the sections below. Where we have not been able to fully assess the operator's proposals to meet BAT conclusion requirements but have received commitments to implement BAT, we have set time sensitive improvement conditions alongside backstop bespoke permit conditions.

Improvement conditions alone would not contain sufficient legal certainty to require an operator to have BAT in place. However, we acknowledge that this application is for an existing activity which has been operating for several years and we recognised that a pragmatic approach was needed to bring this unpermitted installation activity into environmental regulation.

To issue permits without agreeing that an activity fully meets BAT is in essence a permitted local enforcement position (LEP). LEPs are used by the Environment Agency for activities operating outside of a permit. This method will be implemented by setting prescriptive bespoke conditions in the permit for the outstanding BAT issue. These bespoke conditions include the definitive requirement plus a deadline for those techniques to be implemented – a backstop. We have also set improvement conditions for the timely submissions of detailed plans. Should an operator not comply with an improvement condition, a bespoke condition will be in place for the Environment Agency to enforce against.

For these improvement conditions, we have set a final deadline of 31 March 2030. It should be noted that the implementation date for operators to be compliant with the Waste Treatment BAT conclusions was 17 August 2022. Our deadline specified in the improvement condition provides a sufficient timeframe in which the operator can produce detailed plans to meet BAT and a timetable for their implementation. Where operators do not satisfy the requirements of the improvement condition by 31 March 2030, the Environment Agency may commence enforcement action against the WaSC. Failure of the WaSCs to achieve BAT or failure to take steps to implement BAT by the backstop will be at the operator's risk.

Secondary containment

Secondary containment is a fundamental principle of pollution prevention at industrial sites and waste management facilities. We assess secondary containment provision when determining permit applications. Secondary/tertiary containment is an appropriate protective measure and is a standard requirement of an environmental permit. The Waste Treatment BREF includes BAT conclusion 19 which identifies several relevant techniques *to prevent or, where that is not practicable, to reduce emissions to soil and water*.

WaSC anaerobic digestion facilities store and treat significant volumes of waste sludge and liquids that have the potential to cause pollution to land, air and water and to impact detrimentally on any nearby sensitive habitats or areas of human occupation (also known as sensitive receptors). These facilities are co-located with wastewater treatment works (WwTW) and, by the nature of these

operations, are usually located near to watercourses. They have tended to have little in the way of secondary containment, such as impermeable surfacing or bunding, that would protect the environment in the event of a loss of containment.

The most common receptors we consider could be impacted by a loss of containment include groundwater (aquifers), water courses, designated conservation areas (such as Sites of Special Scientific Interest (SSSI), Special Areas of Conservation (SAC), Special Protection Areas (SPA) and Ramsar sites), the adjacent WWTW and nearby human receptors such as residential and commercial premises.

Given the number, significance and complexity of the WaSC's sludge AD facilities, we have provided advice on what they should have regard to when assessing their facilities. We consider that this advice, and the timescales afforded to the WaSCs to submit information in support of their permit applications, is above and beyond that which would typically be given to permit applicants.

We advised the WaSCs to provide two main components of assessment aimed at clearly identifying where a facility has sufficient measures in place to protect sensitive receptors, and where improvements may need to be implemented.

The two components were:

- Containment assessment against the recommendations of CIRIA C736 guidance - *Containment systems for the prevention of pollution: Secondary, tertiary and other measures for industrial and commercial premises* (2014).
- Completion of the ADBA tool to identify sources, pathways and receptors, and risks.

We also advised applicants to submit spill modelling as supporting evidence to demonstrate the effectiveness of current containment measures and assess any identified necessary improvements.

We advised the WaSCs (including this operator) of the requirements of containment assessments on multiple occasions, including:

- At a workshop held by Water UK in February 2020 (Water UK members are UK water and wastewater service suppliers for England, Scotland, Wales and Northern Ireland, the operator is a member of Water UK) – Presentation Title: Permitting Overview – Including section on containment – Surfacing, bunding and capacity, presented by a Senior Permitting Officer of the Environment Agency National Permitting Service.

- Written advice sent in March 2021 by us including.
 - Sector specific pre-application advice note.
 - BAT gap analysis template tool.
- Presentation on 14 July 2021, delivered to Water UK, titled, *IED Permitting TaF + Spill Modelling*, which the operator attended, in which spill modelling was specifically discussed, along with a reiteration of application requirements. Spill modelling seminar presented by a Member of the Project Steering Group of CIRIA C736.

There are also various additional references to containment in guidance that is widely disseminated in the industry including:

- Waste Treatment BAT Conclusions.
- *Environmental permitting guidance on the control of emissions* (gov.uk).
- *How to comply with your environmental permit. Additional guidance for: Anaerobic Digestion* Reference LIT 8737 Report version 1.0 dated November 2013.
- *Appropriate measures for the biological treatment of waste* – consultation document and response comments.
- *Biological waste treatment: appropriate measures for permitted facilities* - Guidance - GOV.UK (www.gov.uk)
- *Emissions control - Non-hazardous and inert waste: appropriate measures for permitted facilities* - This is not directly applicable to biological treatment but will be replicated in the appropriate measures as mentioned in the above bullet point.
- *SR2021 No 10: anaerobic digestion of non-hazardous sludge at a waste water treatment works, including the use of the resultant biogas*. This specifically applies to sludge AD facilities.

CIRIA C736

CIRIA C736 is considered the industry containment assessment standard of choice and is based on the source-pathway-receptor approach to risk assessment. It provides a clear methodology for demonstrating BAT, appropriate measures and compliance with permit conditions.

It is applicable for identifying and managing the risk of storing substances which may be hazardous to the environment and applies to activities ranging from small commercial premises to large chemical facilities. It primarily considers the potential consequences of tank failure and provides a risk assessment methodology to support a classification system for containment, providing different levels of performance for different risks. The aim is to break the pathway between source and receptor.

The guidance provides containment options and examples of good practice, but it is not prescriptive and there may be circumstances where it could be appropriate to use other methods where at least an equivalent level of environmental protection is provided, however this would need to be provided at the point of permit determination.

Due to the nature of sewage sludge, waste cake or waste liquors, it is clear that this would be considered to be both a short and long-term hazard to the environment if released. Given the locations of sites that deal with these materials generally, it is reasonable to conclude that any major tank failure at an individual site will have the potential to cause significant damage to sensitive receptors.

Where CIRIA C736 measures are not considered to be relevant or appropriate for a specific facility, an explanation should be provided using a risk-based approach. For existing facilities where measures cannot easily be achieved, we expect site based specific risk assessments associated measures and any alternative measures to be proposed at permit determination which achieve at least an equivalent standard to provide at least the same level of environmental protection. It should be recognised however that CIRIA C736 includes specific guidance for operators who need to implement secondary containment provisions at existing facilities.

Newly built facilities and assets should be designed and built to CIRIA C736 report recommendations or to at least an equivalent approved standard. Newly built facilities and assets not designed and built to CIRIA C736 report recommendations, or to at least an equivalent approved standard would not be considered to provide suitable primary and secondary containment, and as such would not comply with BAT. Existing facilities may be unlikely to be compliant with CIRIA C736 due to the viability of retrofitting to meet the recommendations. However, the same containment assessments are still required, and improvements should be proposed to demonstrate at least equivalent appropriate measures of environmental protection.

ADBA tool and guidance

The ADBA tool and guidance have been specifically designed as a guide for secondary containment for anaerobic digestion. The guide states ‘Both the guide and the classification tool draw upon the principles and methodologies within CIRIA C736. The principles within CIRIA C736 are generally accepted as good practice in the design and construction of containment systems. The principles of CIRIA C736 are distilled into this accessible guide, which attempts to draw out the parts relevant to the AD sector’.

The tool itself is clearly set out to provide an inventory of sources, pathways and receptors and aligns with the containment system class types in CIRIA C736. It provides risk ratings and allows mitigation measures to be considered.

Alternative assessment methods

Where our guidance refers to CIRIA C736 it also allows for other equivalent approved standards. This does provide operators with the option of using other approved standards, but they must offer at least the same level of environmental protection.

Where CIRIA C736 and ADBA tool assessments, or equivalent approved standards, are not provided, it is difficult or impossible to satisfactorily assess permit applications for compliance with BAT, appropriate measures or an environmental permit.

Assessment of this facility

The operator did submit an assessment which has given regard to CIRIA C736, including proposals for improvements.

- The operator did submit a completed ADBA tool.
- The operator did submit spill modelling.
- The operator provided initial secondary containment proposals in accordance with Environment Agency guidance, [Control and monitor emissions for your environmental permit](#).
- Detailed secondary containment design will be provided to the Environment Agency in response to improvement conditions (IC15a)

The containment options proposed by the operator for Avonmouth Bioresources Centre (BC) included the installation of bund walls and impermeable surfacing at modelled locations in order to prevent a loss of containment beyond Avonmouth Bioresources Centre and adjacent WRC. The spill model is based on utilising two separate areas of the sites (The import sludge tank area and the BC main area - revision 2). It should be noted that other areas of containment had been explored including the BC main area revision 1 (MADs P1-P6 and Bellmer thickened sludge tank) and the SAS Balance tank (which is now considered to be outside the permitted area scope/considered a WRC asset) and modelled for, however only the two areas previously mentioned represented containment across all the sludge AD tanks (including some of the food waste AD assets that were located in the same bunded area as the BC main area). The import sludge tank area provides containment proposals for the digesters, area 2 provides containment

proposals for the import sludge tank and the BC main area – revision 2 - provides containment proposals for the rest of the asset including APD GBT 1,2,3 Feed Tank, APD feed tank, consolidation tanks, Belmer feed tank, thickened SAS transfer tank, acid phase digestion APDs (O1-O6), mesophilic anaerobic digesters MADs (P1-P8), secondary sludge storage tanks and the centrifuge feed tank. In addition BC main area – revision 2 also includes the two food waste AD MADs tanks, hydrolysis buffer tank, post digestion storage tank and the food liquid waste tank. They have also included the contents of the currently out of scope SAS balance tank to ensure if this tank is relocated within this area that there would be sufficient spill volume despite it not being formally identified as a permitted asset (part of the WRC). The spill model is based upon the failure of the only tank in the sludge import tank area, and is modelled at 110% of the tanks volume (269m³), with 296m³ contained and several tanks spilling their contents simultaneously in the BC main area. Revision 2 is calculated at 25% of all tank volumes, the total volume being 41,362m³ with a containment volume in that bunded area of 10,341m³.

Therefore with consideration made of the above statements, the proposed solution met the requirements of section 4.2.1 of CIRIA 736 that requires “Where two or more tanks are installed within the same bund, the recommended capacity of the bund is the greater of:

- 1) 110% of the capacity of the largest tank within the bund.
- 2) 25% of the total capacity of all the tanks within the bund, except where tanks are hydraulically linked in which case they should be treated as if they were a single tank.

Reasons for accepting secondary containment proposals

The Environment Agency recognises that the operator’s proposals for secondary containment measures at the installation are not complete. Our established environmental permitting process outlines that where information is missing or insufficient, that information can be requested. Where information is unsatisfactory, we may proceed to return an application as not duly made or refuse a duly made application. Our processes state that we generally don’t set improvement conditions that require BAT to be demonstrated at some date after the permit application has been consulted on and determined. Generally, we should be satisfied whether operations will use BAT at the appropriate time, and we should make that assessment at the time we issue any permit or variation.

However, we recognise that this industrial activity is already existing and being undertaken and consider it appropriate, where possible, to bring these activities into environmental regulation as an installation. While the current operations

are a pollution risk, the operator is not introducing new risks to the environment. It is important to note that any applications including new plant and bulk tanks would require a demonstration that secondary containment is designed in line with CIRIA C736 (or possible equivalent alternative) before a permit could be issued.

While detailed secondary containment infrastructure design was not supplied, the proposals describe what they plan to implement and follow the primary requirements for bund design (as outlined in our guidance [Control and monitor emissions for your environmental permit](#)). The operator has also confirmed that the secondary containment measures will be designed in compliance with CIRIA C736 by a qualified structural engineer. We have received an effective risk assessment which demonstrates the extent and impact of bulk tank failure on the receiving environment. This was via a spill modelling assessment CIRIA 736 IED report - secondary containment assessment (version 2 – Dec 2023) based on the failure of worst-case tanks. These risk assessments/spill models show that the proposed containment strategies would contain effluent/digestate on site.

The section, *Bespoke permit conditions* of this document, provides a general explanation why we have issued this permit without a full determination of various key issues with the application.

We have included an improvement condition IC15a in the permit for the operator to progress the proposals submitted within the application and to provide additional details as they are developed and implemented. We require that the proposals must be implemented by 31 March 2030.

Open treatment or storage tanks pre-anaerobic digestion

The process includes, prior to AD, the thickening and dewatering of indigenous and imported sewage sludge which is a directly associated activity (DAA) of the AD process.

The BREF defines this activity as the 'Treatment of water-based liquid waste' providing examples of wastes that would be considered as water-based liquid wastes. These include wastes under the category '19 08 wastes from waste water treatment plants not otherwise specified'. The treatment of this waste in the dewatering and thickening stage, and the subsequent emissions to air from connected abatement will be subject to the BAT AELs specified within BAT conclusion 8 and any odour control unit that serves this DAA must meet the requirements of BAT 53.

BAT 53 requires that in order to reduce emissions of hydrogen chloride (HCl), Ammonia (NH₃), and organic compounds to air, BAT is to apply BAT 14d (which requires the containment, collection and treatment of diffuse emissions) and to

use one or a combination of the techniques including adsorption, biofilter, thermal oxidation and/or wet scrubbing.

The applicant identified open tanks and processes pre-AD which include the strain press feed sumps, liquor sumps, strained sludge sump, import sludge reception tank, APD GBT (1, 2 and 3) feed tank, APD GBTs (1, 2 and 3), APD feed tank, consolidation tanks, Bellmer feed tanks, Bellmer GBT, Bellmer thickened sludge tank and the thickened SAS transfer tank.

We therefore asked the operator to provide written confirmation that they will provide enclosures/covers for these open tanks along with any associated emission abatement systems in line with BAT 14 and BAT 53.

To ensure the operator implements these changes, we have set improvement condition IC16 with a final deadline of 31 March 2030. It should be noted that the implementation date for operators to be compliant with the Waste Treatment BAT conclusions was 17 August 2022. We believe that the deadline specified in the improvement condition provides a sufficient timeframe in which the operator can produce and implement detailed plans to meet BAT. Where operators do not satisfy the requirements of the improvement condition by 31 March 2030, the Environment Agency may commence enforcement action for that failure the WaSC. Failure of the operator to achieve BAT or failure to take steps to implement BAT by the backstop will be at the operator's risk.

We consider the adoption of this more flexible approach to be pragmatic and proportionate, securing adequate progress towards, and delivery of, BAT within a reasonable timescale. Allowing a longer timescale would not, in our view, be acceptable because of the ongoing risks to the environment and human health. A stricter approach would most likely have meant that we would refuse the application.

The permit also includes bespoke permit conditions alongside the ICs. These bespoke permit condition requires the operator to have the appropriate infrastructure installed on the site by 31 March 2030.. Should the operator fail to implement the changes required by that deadline, the Environment Agency may undertake enforcement proceedings against the operator. This position is in place to facilitate the opportunity for operators to become BAT compliant and install necessary infrastructure. The Environment Agency recognises that this approach is different to standard environmental permitting processes. However, we consider that the operator has provided sufficient commitment that they will undertake the necessary improvements to prevent uncontrolled emissions from open tanks. Backstop conditions in the permit will ensure this is achieved.

The section, *Bespoke permit conditions* of this document, provides a general explanation as to why we have issued this permit without a full determination of various key issues with the application.

Uncontrolled biogas and waste gas emissions – open treatment or storage tanks for sludge AD

Anaerobic digestion is a biological treatment of waste which uses natural processes where microorganisms break down organic matter in the absence of oxygen into biogas and digestate. Feedstock of sewage sludge and separately collected waste materials may have wide-ranging physical and chemical characteristics which have varying biogas production potential. Biogas has a varied composition but typically contains predominantly methane, carbon dioxide and nitrogen with traces of hydrogen sulphide and ammonia. Due to the methane component, biogas is combustible and has a significant global warming potential. In addition, fugitive emissions of biogas could also risk fire or explosion, as well as toxicity from gases such as hydrogen sulphide.

The Waste Treatment BREF and BAT conclusion 14 states:

In order to prevent or, where that is not practicable, to reduce diffuse emissions to air, in particular of dust, organic compounds and odour, BAT is to use an appropriate combination of the techniques...., as listed in the BAT Conclusion. An extract from the appropriate techniques listed in BAT Conclusion 14 for the prevention, or where that is not practicable, the reduction of diffuse emissions to air from open tanks is set out in Table 2 below.

Table 2			
Technique		Description	Applicability
d	Containment, collection and treatment of diffuse emissions	This includes techniques such as: • storing, treating and handling waste and material that may generate diffuse emissions in enclosed buildings and/or enclosed equipment (e.g. conveyor belts); • maintaining the enclosed equipment or buildings under an adequate pressure; • collecting and directing the emissions to an appropriate abatement system, via an air extraction system and/or air suction systems close to the emission sources.	The use of enclosed equipment or buildings may be restricted by safety considerations such as the risk of explosion or oxygen depletion. The use of enclosed equipment or buildings may also be constrained by the volume of waste.

BAT require that waste stored which produces waste gases must be enclosed. Gases must then be appropriately abated. Section 2.3.5.5 of the Waste Treatment BREF states:

Because flaring is both a source of pollution and leads to the burning of a potentially valuable product, its use should be limited to non-routine, momentary stoppages or emergency releases. Uncontrolled emissions (especially VOCs) from vents and relief valves should be routed to recovery systems, with flares serving only as a backup system.

This section of the BREF is in reference to the flaring of biogas and not directly relevant to open tanks. However, it is important to stress that due to the pollution potential from uncontrolled emissions of biogas, it is essential that these emissions are collected and utilised either as a fuel, in storage or for further treatment to refine the biogas. It is not appropriate to store or treat digestate producing biogas within open tanks.

We acknowledge that BAT conclusion 14d provides limits on the applicability for enclosing waste where there is a potential risk from explosion. Storage of unstable digestate will release unspecified quantities of combustible gases. However, the standard industry practice within the commercial anaerobic digestion sector is to minimise unstable digestate storage by typically using longer residence times within sealed digesters to maximise biogas generation.

The Health and Safety Executive (HSE) provide general guidance on bulk storage tank design:

<i>Design</i>	<i>Codes</i>	–	<i>Plant</i>
https://www.hse.gov.uk/comah/sragtech/techmeasplant.htm			
<i>Storage of flammable liquids in tanks</i>			
Storage of flammable liquids in tanks HSG176 (hse.gov.uk)			

We have been advised that, in the view of the HSE, the competent installation of tank covers is possible using current tank standards. We believe it is possible to design and modify tanks that meet both the specific circumstances and relevant engineering standards.

We also recognise that the covering of tanks may have an impact on whether the site needs to consider the requirements of the Control of Major Accident Hazards (COMAH) Regulations 2015. The creation of additional enclosed space(s) in the site (inside the newly enclosed tanks and any associated new abatement equipment) where dangerous substances are present (or anticipated to be present) would have the consequence of increasing the COMAH inventory, which could in turn move a site from *Lower* to *Upper* Tier or bring a site into the scope of the regulations. An operator will need to consider these requirements when producing plans and designs for tank covers.

The Environment Agency considers the covering of tanks generating biogas (and channelling the gas to utilisation plant/storage) as BAT. It must be undertaken by any operators treating waste via anaerobic digestion (and subsequent storage). Any alternative approach to this must form part of a permit application supported by evidence-based justifications.

This installation currently uses six acid phase digesters (APDs) and eight mesophilic anaerobic digesters (MADs) for the sludge AD to undertake anaerobic digestion. The site's annual throughput of waste treated via anaerobic digestion is 2,850,000 tonnes for sludge AD. The waste undergoes this treatment in these tanks with a Hydraulic Retention Time (HRT) of 2-3 day in the APDs and 11-12 days in the MADs for sludge AD. HRT is defined as the working volume of the digester divided by the rate of feeding as volume per unit time and is expressed in days. It is a fundamental design parameter and is typically a determining factor in sizing the AD plant. Biogas produced during this stage is collected in the roof space of digestion tanks and the standalone biogas holder and subsequently channelled via sealed pipework to gas utilisation structures which are shared between the two AD activities. This site uses five Combined Heat and Power (CHP) engines to combust the biogas to use the energy generated on site.

The treated waste, described as sludge or digestate is discharged into the secondary sludge storage tank (SSST), centrifuge feed tank, centrifuges 5 and 6, centrifuges 7 and 8, Flottweg centrifuges and road centrifuges from the sludge digesters. These tanks/assets are uncovered, therefore, any waste gases, including biogas will be emitted from the tank/assets to atmosphere. The large quantities of waste feedstock and relatively short HRT indicate that the digestate could still be producing biogas after it has been discharged into the open secondary sludge storage tank (SSST), centrifuge feed tank, centrifuges 5 and 6, centrifuges 7 and 8, Flottweg centrifuges and road centrifuges. From our regulatory experience, we know biogas levels are still discharged to air from post digestion treatment (such as dewatering). This step can be over a week since the digestate was stored in open tanks. Therefore, emissions of biogas is likely to be even higher during the periods of storage in open 'secondary digester' tanks.

We asked the operator to provide written confirmation that they will commit to covering the secondary sludge storage tank (SSST), centrifuge feed tank, centrifuges 5 and 6, centrifuges 7 and 8, Flottweg centrifuges and road centrifuges and a description that shows the tank/asset enclosure will be in line with guidance, *Biological waste treatment: appropriate measures for permitted facilities*. We also asked how biogas generated from the secondary sludge

storage tank (SSST), centrifuge feed tank, centrifuges 5 and 6, centrifuges 7 and 8, Flottweg centrifuges, road centrifuges will be utilised as a fuel or stored for utilisation off site.

The Environment Agency recognises that the use of open tanks across the wastewater industry is widespread. While the operator did not provide detailed proposals to enclose tanks, they have committed to develop plans to put these infrastructure changes in place to prevent uncontrolled emissions of biogas from open tanks in the near future.

To ensure the operator implements these changes, we have set an improvement condition (IC17a) to capture the gases produced within the open tanks post AD. The IC requires the tanks to be enclosed and connected to the gas management infrastructure, or in rare cases, to a suitable odour abatement system which treats the potentially polluting components of the waste gas. We state that an odour abatement system will only be suitable in rare cases because without evidence to demonstrate otherwise, these tanks and storage infrastructure likely continuously emit a methane rich gas to the environment. It is unlikely that emissions will be comprised of gases which can be controlled by traditional odour abatement techniques. It is therefore most likely that the operator will need to capture and use the gas or treat for the purpose of producing a viable biomethane.

The methane component of a biogas will not be treated by odour abatement techniques and will be discharged into the atmosphere. Only if methane is not a relevant component in the waste gas will odour abatement plant be justified for use on the secondary sludge storage tank (SSST), centrifuge feed tank, centrifuges 5 and 6, centrifuges 7 and 8, Flottweg centrifuges and road centrifuges.

This improvement condition does not allow the operator to determine that the open tanks can remain uncovered. The improvement condition is not an opportunity for the operator to propose alternative methods to enclosing tanks, capturing gases and treating/using the gas.

The operator did not propose an appropriate alternative to the BAT technique of enclosing their tanks with any supporting evidence. The operator is therefore required to enclose the open tanks/assets, secondary sludge storage tank (SSST), centrifuge feed tank, centrifuges 5 and 6, centrifuges 7 and 8, Flottweg centrifuges and road centrifuges.

IC17a requires the operator to produce a 'post anaerobic digestion vessel cover plan'. The plan requires the operator to include detailed design information on tank cover design and associated biogas gas management infrastructure (or in rare cases waste gas abatement plant). In addition to the design requirements, the operator must present appropriate evidence that the waste gases will be controlled by the proposed design. The operator has confirmed their commitment to enclosing these tanks and to the requirements of the improvement condition.

The permit also includes bespoke permit conditions alongside the ICs. This bespoke permit condition requires the operator to have the appropriate infrastructure installed on the site by 31 March 2030. Should the operator fail to implement the changes required by that deadline, the Environment Agency may undertake enforcement proceedings against the operator. This position is in place to facilitate the opportunity for operators to become BAT compliant and install necessary infrastructure. The Environment Agency recognises that this approach is different to standard environmental permitting processes. However, we consider that the operator has provided sufficient commitment that they will undertake the necessary improvements to prevent uncontrolled biogas emissions and/or other waste gas emissions from open tanks. Backstop conditions in the permit will ensure this is achieved.

Emissions to air – Combustion

Biogas generated through the AD of waste contains a high quantity of methane and is often used to provide energy to onsite operations. Biogas is commonly combusted within on-site combined heat and power engines (CHP) or boilers. CHP engines produce heat and electricity. Heat is used to provide energy in the form of steam or hot water and is directed to the anaerobic digestion plant processes, while electricity can be utilised to power other plant on site.

Combustion of biogas or other fuels such as natural gas produces waste gas emissions which are discharged to the atmosphere via a stack. The combustion of biogas releases the following products of combustion; oxides of nitrogen (expressed as NO₂), sulphur dioxide (SO₂), carbon monoxide (CO) and volatile organic compounds (VOC).

The existing combustion assets that will be used for the sludge AD operation are currently permitted under the existing food waste AD and as such we have undertaken a review of these as part of the Regulation 61 notice above.

We have ensured that individual combustion plant is subject to the required emission limit value (ELV) as stated in the permit. This includes those required

by the Medium Combustion Plant Directive (MCPD) which are currently in effect, or which have a future effective date. See Table S3.1 in the permit.

We have included improvement IC21 in the permit which requires the Operator to assess methane slip resulting from the combustion of biogas via the CHP engines. Following an assessment of the data, the Environment Agency shall consider whether emission limits for volatile organic compounds are applicable for this installation.

Indirect emissions of waste water

AD installations produce a series of liquid wastes. These waste waters (also known as 'liquid digestate' or 'liquors') are discharged to the adjacent WwTW. As explained at the start of this document, WwTW are regulated under separate legislation, the UWWTR and does not form part of this installation. The discharge of waste waters to the WwTW is therefore a point source emission and classed under the Waste Treatment BREF as an indirect emission to water. This AD has been in operation for several years but previously unpermitted as an installation for the operation of the sludge AD assets.

The waste water discharged to the WwTW is not currently subject to monitoring or control. Waste waters, after discharge to the WwTW and treatment under UWWTR are discharged to surface waters (rivers, streams) or in some cases direct to the sea. Across the sewage sludge industry, a wide variety of incoming wastes, trade effluents and indigenous sewage sludges are treated via anaerobic digestion (combined they are subject to regulation under the EPR). Once discharged into the main WwTW, any pollutants within the discharge will be diluted with no control over the level of pollutants emitted to the works. This means that across the sewage sludge industry, there is no knowledge of the extent of pollutants entering the main works for treatment. This lack of knowledge means that WaSCs do not know if their WwTW are capable of treating the waste waters produced at an AD installation.

Description of waste water discharge

Effluent is generated on site through the dewatering and thickening of indigenous and imported sludges prior to the anaerobic digestion process, the dewatering of digestate following the anaerobic digestion process, the production of biogas condensate, biogas pipeline transfer, digestate transfer, centrifugation and post-digestion storage.

The waste waters are discharged to the adjacent Avonmouth WwTW. Any treatment of this effluent once it arrives at the WwTW is currently regulated under the UWWTR process, not under control of an environmental permit. However, the effluent being discharged from the WwTW is controlled by a permit. As the UWWTR waste water is discharged to a watercourse, we

consider the effluent generated through the AD process constitutes an indirect discharge to water.

As such operators of an installation must establish and maintain inventories, including information about the characteristics and composition of waste waters in accordance with BAT conclusion 3 of the Waste Treatment BREF. BAT conclusion 3 states:

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 which are identified for waste water as:

Information about the characteristics of the waste water streams, such as:

- *average values and variability of flow, pH, temperature, and conductivity;*
- *average concentration and load values of relevant substances and their variability (e.g. COD/TOC, nitrogen species, phosphorus, metals, priority substances / micropollutants);*
- *data on bioeliminability (e.g. BOD, BOD to COD ratio, Zahn-Wellens test, biological inhibition potential (e.g. inhibition of activated sludge))*

The operator did not have this data prior to submitting their application for a bespoke installation permit. The Environment Agency has found that across the waste water sector, WaSCs have not undertaken a comprehensive analysis of their emissions from the installation activities to the WwTW. In general, WaSC installations accept trade effluents (via consented discharges in the catchment), indigenous sludges and separate waste streams via road tanker. The waste materials treated via the AD plant are potentially diverse and the composition of the feedstock and treated digestates could contain significant variation in pollutants.

Operators of installations under the Waste Treatment BREF must establish an emissions inventory. The operator should be compliant with this BAT conclusion requirement at the point of submitting a permit application. The waste water emissions inventory informs treatment methodologies, environmental risk assessments and monitoring requirements. However, across the sector, this information is not available. The Environment Agency recognises that the operator's emissions discharged to the WwTW have never been fully quantified, and therefore, accept that emissions to the WwTW have not been subject to a quantitative risk assessment. In addition, the operator also cannot demonstrate that they are compliant with BAT AELs for indirect discharges to water (as specified within BAT conclusion 20 of the Waste Treatment BREF).

The waste water discharged to the WwTW is treated via the requirements under the UWWTR. However, this approach may not effectively treat all the pollutants that could enter the WwTW after discharge from the installation. For example, characteristic treatment methods at WwTW do not typically treat and remove heavy metals or other specified pollutants from the waste water.

We understand and recognise that this industrial activity is already existing and consider it appropriate, where possible, to bring these activities into environmental regulation as an installation. While the operations are a pollution risk, the operator is not introducing new risks to the environment. It is important to note that any applications including a new emission to water would require a demonstration that emissions would not adversely impact any receiving waters, or breach relevant BAT AELs before a permit could be issued.

Our guidance, [Surface water pollution risk assessment for your environmental permit](#), indicates that establishing a representative composition of the waste water streams requires a number of samples over a long period (12 – 36 samples). The scope of pollutants to be identified in the waste water depends on what substances are likely to be within the waste water at the point it is discharged from the installation. To determine what is in the waste water, the operator will need to examine and have a good understanding of the inputs to the installation. It is the responsibility of the operator producing the effluents/waste waters/liquors to understand what pollutants need to be assessed based on their understanding of the waste waters.

To establish a waste water inventory and to facilitate a quantitative risk assessment from this indirect emission point, we have set improvement conditions. Our processes state that we generally don't set improvement conditions that require BAT to be demonstrated at some date after the permit application has been consulted on and determined. Generally, we should be satisfied whether operations will be BAT at the appropriate time, and we should make that assessment at the time we issue any permit or variation. However, for the reasons set out above, this assessment is not possible due to the lack of data in this area across the WaSC sector. We consider setting improvement conditions as a pragmatic approach to identify what is in the waste water to then implement future improvements.

The permit includes improvement conditions IC19a, IC19b and IC19c. There are three stages to this improvement programme. The first (IC19a) requires the operator to submit and carry out a sampling and analysis program and gather the relevant data on the waste water. In accordance with the Waste Treatment BREF, the IC requires the operator to determine the composition of the pollutants which have BAT-AELs (these include heavy metals). Due to the variety of inputs to the waste treatment process and the unknown composition of the waste waters proposed for discharge to the WwTW, we cannot consider

this effluent as straightforwardly a 'biodegradable waste'. Therefore, the IC also sets the requirement on the operator to establish an inventory of pollutants of 'all relevant substances'. The scope of pollutants the operator must identify depends on what substances are likely to be within the waste water at the point it is discharged from the installation. To determine what is in the waste water, the operator will need to examine and have a good understanding of the inputs to the installation. This installation accepts waste inputs from indigenous and imported sludges into the sludge AD process.

Due to this variety of inputs and the requirements for a minimum of 12 samples, we have specified that this monitoring period be for at least a year to determine a representative understanding of the discharge.

The Environment Agency recognises that 12 months is a long period but establishing the composition of the waste water will facilitate long term improvements and ensure that all potential pollutants are able to be controlled.

On completion of IC19a, IC19b requires the operator to undertake a full assessment of the results providing a summary of the sample results, a completed H1 risk assessment(s) and detailed modelling (where necessary) with an assessment made against the parameters specified in the relevant environmental standards as specified within our guidance. We also require the operator to submit proposals and/or additional measures required to prevent or minimise any significant emissions from the installation along with timescales for implementation. IC19c requires the implementation of any relevant improvements identified.

The operator has provided written confirmation that it will initiate a sampling programme to determine the composition of the waste water.

The overarching aim of the improvement programme is to establish comprehensively what the operators of AD installations discharge to WwTW and to drive long term improvements. The lack of existing data across the industry means that the Environment Agency, rather than refusing environmental permit applications, facilitates a process for WaSC operators to achieve BAT and to meet environmental standards for long term environmental protection.

Odour management

The Waste Treatment BREF outlines techniques for minimising the impact from odour pollution from operations which are likely to cause odour. Anaerobic digestion and the handling/storage of various waste sludges and organic wastes can be highly odorous. The Waste Treatment BREF includes general BAT conclusions which operators must implement (BAT 10 and 12 where odour nuisance at sensitive receptors is expected and/or has been substantiated). These include:

- BAT 10 – Monitoring of odour emissions
- BAT 12 – Odour management plan
- BAT 13 – Techniques to reduce odour emissions
- BAT 14 – Reduce diffuse emissions to air

Odour and BAT

The Waste Treatment BREF outlines techniques for minimising the impact from odour pollution from operations which are likely to cause odour. Anaerobic digestion and the handling /storage of various waste sludges and organic wastes can be highly odorous. The Waste Treatment BREF includes general BAT conclusions which operators must implement (BAT 10 and 12 where odour nuisance at sensitive receptors is expected and/or has been substantiated).

Odour management plan

As part of this application we reviewed the odour management plan and we are satisfied that the site complies with the requirements of Waste Treatment BAT conclusion 10 and 12 apart from the implementation of abatement in line with BAT 34.

Air/odour abatement systems

The installation includes industrial processes which produce waste gas and odour emissions. BAT conclusion 14 of the Waste Treatment BREF states that emissions from diffuse sources should use techniques like, *collecting and directing the emissions to an appropriate abatement system via an air extraction system and/or air suction systems close to the emission sources*.

This installation includes the storage and treatment of wastes in the SAS GBT building and the operator extracts these emissions to air via a vent. There is no odour abatement system in place to prevent or reduce diffuse emissions. Therefore, the dispersion of the waste gases does not demonstrate compliance with BAT conclusion 14 of the Waste Treatment BREF.

We recognise that this industrial activity is already existing and consider it appropriate, where possible, to bring these activities into up-to-date environmental regulation. The current site waste gas control measures are not in line with BAT. While the operations are a pollution risk, this permit does not introduce new risks to the environment. For these reasons, we consider setting an improvement condition for determining an abatement system after a permit has been granted as a pragmatic approach to ensure operations are brought into regulation and provisions are in place to ensure that appropriate abatement

systems will be proposed. Subsequently, improvement condition IC23 sets out how we expect the operator to propose an effective abatement system for their waste gas emissions. It involves selecting abatement technologies which will suitably treat the odorous compounds and waste gases with detailed evidence.

Any new abatement plant should be designed to reduce odours and where required, ammonia, TVOC and HCl. For the abatement plant or systems which the operator will propose as a result of IC23, an operator will need to ensure that new abatement systems achieve the BAT AEL for odour or limits defined by the plant design, whichever is less. We have therefore set, as a minimum, the BAT AEL for odour concentration of 1,000 ouE/m³ in this permit. Should the operator seek to install an abatement system which cannot meet this requirement, it is unlikely that the abatement plant will be BAT.

Additionally, we have set a further improvement condition (IC24) to verify that the chosen abatement system operates effectively. This is to substantiate the conclusions established in IC23 whether the new abatement systems have been effective and adequate to prevent and/or minimise emissions released to air. The improvement condition requires the operator to demonstrate via determining the composition of waste gas emissions, monitoring and additional risk assessment that the installed abatement system effectively treats the emissions to air. Where further improvements are identified, the operator is required to implement these measures.

Odour conclusions

Based upon the information in the application and the ICs implemented we are satisfied that the appropriate measures will be in place to prevent or where that is not practicable to minimise odour and to prevent pollution from odour.

Bioaerosols

Site-specific bioaerosols risk assessments (SSBRA) are required where:

- The operational area (including abatement plant) is located within 250 metres of sensitive receptors: or
- Where area or point source emissions may pose a risk to the nearest sensitive receptor's location.

SSBRAs demonstrate that the process and/or abatement measures adequately prevent, or where this is not possible, significantly reduce the risk of bioaerosols release, and that the resulting activity will be unlikely to expose the nearest sensitive receptor to elevated concentrations of bioaerosols.

There are no external site operational processes and/or channelled /point sources within 250 metres of a sensitive receptor. Monitoring of bioaerosols is not required at the installation.

Annex 6 - Improvement conditions for sludge AD and bespoke waste operations.

Primary containment

We recognise that many sludge storage and treatment vessels were constructed prior to the current permitting requirements and their design may not be compatible with BAT as described in the relevant BREF documents. The operator provided an inventory of their tanks and described the condition of those assets. Comprehensive evidence was not provided to assess the condition of the tanks and determine whether they are suitable for containing potentially polluting wastes and waste waters. However, as these tanks are already existing and perform an ongoing industrial operation, we have set an improvement condition in the permit to address any potential deficiencies in the existing site's primary containment.

IC18 requires the operator to review (undertaken by an appropriately qualified engineer) the physical condition of the primary containment and establish a program of works to implement any necessary individual measures to ensure that the primary containment is fit for purpose. The Environment Agency will review these submissions with regard to the guidance, *CIRIA C736 Containment systems for the prevention of pollution*.

Stability of whole digestate

The Waste Treatment BREF indicates that to prevent diffuse pollution to air, waste which potentially poses a risk should be stored in enclosed buildings or equipment. Solid digestates, also described as sludge cake are routinely stored externally before being removed from the site. Instead of requiring the sludge cake to be covered and fugitive emissions to be collected and abated, we are requiring operators to determine the stability of this material. A digestate or sludge cake which is unstable will produce fugitive emissions including biogas, odour and ammonia. The operator has not presented evidence of the stability of the externally stored digestates. Stability is defined in the specification for digestate, BSI PAS 110:2014. The standard defines digestate stability as the '*point at which the rate of biological activity has slowed to an acceptably low and consistent level and will not significantly increase under favourable, altered conditions*'. The wider water industry does not have reliable data on the stability of the digestate they produce. We have therefore set an improvement condition (IC25) for the operator to produce stability data for their output digestate. This improvement condition applies to all sludge treatment installations and will

enable the Environment Agency to gather data to understand the levels of stability across the industry. Where operators produce digestates which have not been stabilised by the AD process, the Environment Agency will require an operator to:

- Improve the stability of the AD process (for example longer residence times)
- Enclose cake storage areas and treat diffuse gas emissions.

Furthermore, this data will feed into future work with the industry in establishing a benchmark to determine stability of the digestate.

The stability of the digestate depends on numerous factors, including type of feedstock, pre-treatment and digestion process and how this is managed in terms of organic load and residence time. For example, shortening residence times will increase the organic load and reduce the degree to which organic matter within the digester is converted to gas. Where this happens the digestate will be more active and capable of further biodegradation.

The method for understanding the stability of the digestate is by determining the residual biogas potential within the digestate. Residual biogas potential can be worked out by using the methodology, OFW004-005 [N6] as outlined within *BSI PAS 110: Producing Quality Anaerobic Digestate or an equivalent methodology for determining digestate stability*. We have not specified a threshold for residual biogas potential. The threshold defined within PAS 110 is part of a published standard operators use for producing an 'end-of-waste' digestate and not necessarily for establishing a definitive assessment of the potential for biogas generation. However, establishing the residual biogas potential will contribute to the operator's understanding of how stable the anaerobic digestion process has been.

This IC will allow the operator to gather evidence and produce an evaluation of their digestate. There are no definitive thresholds for the operator to meet.

Effectiveness of abatement systems associated with sludge waste AD

The installation includes industrial processes which produce waste gas and odour emissions that are discharged to air via vents or stacks. BAT conclusion 14 of the Waste Treatment BREF states that emissions from diffuse sources should use techniques like, *collecting and directing the emissions to an appropriate abatement system via an air extraction system and/or air suction systems close to the emission sources*. This installation includes the storage and treatment of wastes in tanks and vessels. To prevent diffuse emissions of pollutants such as odour, ammonia and VOCs, emissions are extracted and treated by an air abatement system. The abatement technology used at Avonmouth BC is combination of biofilters and carbon adsorption units. The

treated air stream is then discharged to atmosphere via a stack. The treated air stream is then discharged to atmosphere via a stack.

As part of the determination we reviewed the operator's abatement plant and its suitability in providing effective abatement to diffuse air emissions and can confirm the existing air abatement systems represent techniques as identified in BAT conclusion 34 and BAT conclusion 53.

Additionally, to verify whether existing measures have been effective and adequate to prevent and/or minimise emissions released to air, we have set an improvement condition (IC24a). The improvement condition requires the operator to demonstrate via determining the composition of waste gas emissions, monitoring and additional risk assessment that the existing abatement system effectively treats the emissions to air. Where further improvements are identified, the operator is required to implement these measures. It should be noted that a review of the existing system could determine that the existing systems are not suitable for the waste gas emissions. Should a review identify that a new abatement system is required, the improvement condition indicates that a variation application is needed.

Any new abatement plant should be designed to reduce odours and where required ammonia. For new abatement plant, an operator will need to ensure that new abatement systems achieve the BAT AEL for odour or limits defined by the plant design, whichever is less. The BAT AEL for odour concentration is 1,000 ouE/m³. Should the operator seek to install an abatement system which cannot meet this requirement, it is unlikely that the abatement plant will be BAT.

Abatement systems from dispersion stacks

The installation includes industrial processes which produce waste gas and odour emissions. BAT conclusion 14 of the Waste Treatment BREF states that emissions from diffuse sources should use techniques like, *collecting and directing the emissions to an appropriate abatement system via an air extraction system and/or air suction systems close to the emission sources*. This installation includes the storage and treatment of wastes in SAS GBT building (emission point A59) and the operator extracts these emissions to air via a dispersion stack/vent. There is no odour abatement system in place to prevent or reduce diffuse emissions. Therefore, the dispersion of the waste gases does not demonstrate compliance with BAT conclusion 14 of the Waste Treatment BREF.

The operator's application did not propose an abatement technique for preventing or reducing emissions from the dispersion stack/vent.

We understand and recognise that this industrial activity is already existing and consider it appropriate, where possible, to bring these activities into up-to-date environmental regulation. The current site waste gas control measures are not in line with BAT. While the operations are a pollution risk, this permit does not introduce new risks to the environment. For these reasons, we consider setting an improvement condition for determining an abatement system after a permit has been granted as a pragmatic approach to ensure operations are brought into regulation and provisions are in place to ensure that appropriate abatement systems will be proposed. Subsequently, improvement condition (IC23) sets out how we expect the operator to propose an effective abatement system for their waste gas emissions. It involves selecting abatement technologies which will suitably treat the odorous compounds and waste gases with detailed evidence.

Any new abatement plant should be designed to reduce odours and where required, ammonia. For the abatement plant or systems which the operator will propose as a result of IC23, an operator will need to ensure that new abatement systems achieve the BAT AEL for odour or limits defined by the plant design, whichever is less. We have therefore set, as a minimum, the BAT AEL for odour concentration of $1,000 \text{ ouE/m}^3$ in this permit. Should the operator seek to install an abatement system which cannot meet this requirement, it is unlikely that the abatement plant will be BAT.

Additionally, we have set a further improvement condition (IC24a) to verify that the chosen abatement system operates effectively. This is to substantiate the conclusions established in IC24a whether the new abatement systems have been effective and adequate to prevent and/or minimise emissions released to air. The improvement condition requires the operator to demonstrate via determining the composition of waste gas emissions, monitoring and additional risk assessment that the installed abatement system effectively treats the emissions to air. Where further improvements are identified, the operator is required to implement these measures.

Review of emissions from digestate in riser pipes and the limpet box overflow chambers

The Environment Agency recognise that many sludge storage and treatment vessels were constructed prior to the current permitting requirements and their design may not be compatible with BAT as described in the relevant BREF documents. To facilitate the physical filling operation of digestate containing vessels many WaSCs have incorporated limpet chamber boxes and riser pipes as part of the methodology for how vessels are filled and emptied. During

determination we have asked the operator to identify all limpet chamber boxes as point sources.

In accordance with sections 11.8 (Point source (diffuse) emissions to air) and 11.9 (Leak detection and repair) of *Environment Agency guidance, Biological waste treatment: appropriate measures for permitted facilities* we have set improvement condition (IC22a), which requires the operator to submit a report to quantify the emission releases from the riser pipes and limpet box chambers using leak detection reporting methodology and to outline a programme of works to minimise the release of diffuse emissions to periods during fill and spill only or to consider replacement with a sealed system to achieve fill and spill without giving rise to diffuse emissions via the riser pipes and limpet chamber boxes (i.e. an alternative sealed pumping system).

Bespoke waste activities and other issues

Food soup waste operation (AR15)

This permit also allows a further bespoke waste operation relating to the import of food waste for the purposes of mixing and blending to create food soup. The operator has demonstrated that this operation is to be undertaken using the same assets as the food waste AD with the exception of the post digestion assets and the anaerobic digesters. They have also confirmed that they will only undertake the food soup operation during periods when the food waste AD is inoperable, this includes the current scenario in which they have informed us the food waste AD operation is currently mothballed. The operator has confirmed that the same wastes that are accepted for the food waste AD are also accepted for the food soup operation, so we have used the same waste table (S2.4) and aggregated the annual throughput of 70,000 tonnes per annum between the two activities as they will be carried out when the other activity is not in operation.

We have assessed the proposals for the food soup operations against those requirements outlined in the guidance [Biological waste treatment: appropriate measures for permitted facilities](#), this is due to the operation accepting, storing and treating wastes that are destined for biological treatment as confirmed by the operator as the onward transfer of the food soup would be to a third party site undertaking food waste AD.

The assets that will be utilised have been assessed in line with the regulation 61 review and we have implemented IC24b to assess the effectiveness of abatement associated with emission point A30 – food waste biofilter.

Raw sludge dewatering waste operation

This permit variation includes the addition of a waste operation activity for the import of raw sewage sludge from satellite sites and indigenous sludge from the WwTW for the purposes of dewatering in the pre digestion and post digestion assets of the sludge AD operation with the exception of the APDS and MADs themselves. The operator has confirmed that the dewatering operation is only undertaken during periods in which the sludge AD is inoperable. We have set the same waste table (S2.2) and annual throughput of 2,850,000 tonnes per annum aggregated with the sludge AD operation.

We have assessed the proposals for the dewatering operations against those requirements outlined in the guidance [Biological waste treatment: appropriate measures for permitted facilities](#), this is due to the operation accepting, storing and treating sewage sludge. We have found that the raw sludge trailers used to store the raw sludge prior to removal from site are not compliance with the guidance on section 11 - emission control as they are currently uncovered assets. Raw sludge is highly odorous and the raw sludge trailers are unique to the dewatering waste operation and as a result are not addressed in the improvement conditions set for the Sludge AD assets. In accordance with the biological waste treatment appropriate measures guidance to cover the raw sludge trailers we have set improvement condition IC28.

Annex 7 - Decision considerations for the consolidation application (C015) and partial transfer (T016)

Confidential information

A claim for commercial or industrial confidentiality has not been made.

The decision was taken in accordance with our guidance on confidentiality.

Identifying confidential information

We have not identified information provided as part of the application that we consider to be confidential.

The decision was taken in accordance with our guidance on confidentiality.

Consultation

The consultation requirements were identified in accordance with the Environmental Permitting (England and Wales) Regulations (2016) and our public participation statement.

The application was publicised on the GOV.UK website.

We consulted the following organisations:

- Local Authority – Bristol City Council – No response received.
- UK Health Security Agency (Previously Public Health England) and the relevant Director of Public Health – See consultation responses section.
- Health and safety executive – HSE – No response received.

The comments and our responses are summarised in the [consultation responses](#) section in ANNEX 4 below.

Operator

We are satisfied that the operator is the person who will have control over the operation of the facility after the part transfer of permit EPR/PP3734LK/V014 and C015 under EPR/PP3734LK/T016 and EPR/DP3529MS/T001.

Due to the complexity of modernising the existing permit, the interaction between the two AD operations and assets including the shared gas

infrastructure and the absorption of permit EPR/UP3797EA we have taken a decision to issue a combined permit in the name Wessex Water Services Limited prior to the issue one working day later of the accompanying partially transferred permit. The reference for the two subsequent permits are EPR/PP3734LK/T016 for operator Wessex Water Services Limited and EPR/DP3529MS/T001 operator Wessex Water Entreprises Limited. Whilst this decision document addresses the changes made as part of application EPR/PP3734LK/V014 and EPR/PP3734LK/C015 it is not considered necessary for a separate decision document to be provided for the partial transfer considering no material change other than dividing the existing permitted activities and associated conditions, assets and monitoring requirements between the correctly identified operators.

The decision was taken in accordance with our guidance on legal operator for environmental permits.

The regulated facility

We considered the extent and nature of the facility at the site in accordance with RGN2 'Understanding the meaning of regulated facility', Appendix 2 of RGN2 'Defining the scope of the installation', Appendix 1 of RGN 2 'Interpretation of Schedule 1', guidance on waste recovery plans and permits.

The operator has provided the grid reference for the emission point of the medium combustion plant.

The extent of the facility is defined in the site plans and in the permits. The activities are defined in table S1.1 of the permits.

The site

The operator has provided a plans which we consider to be satisfactory.

The plans show the location of the part of the installation to which this permit applies on that site.

The plan is included in the permit.

Site condition report

The operator has provided a description of the condition of the site, which we consider is satisfactory. The decision was taken in accordance with our guidance on site condition reports.

Nature conservation, landscape, heritage and protected species and habitat designations

We have checked the location of the application to assess if it is within the screening distances we consider relevant for impacts on nature conservation, landscape, heritage and protected species and habitat designations. The application is within our screening distances for these designations.

We have assessed the application and its potential to affect sites of nature conservation, landscape, heritage and protected species and habitat designations identified in the nature conservation screening report as part of the permitting process.

We consider that the application will not affect any site of nature conservation, landscape and heritage, and/or protected species or habitats identified.

We have consulted Natural England on our SSSI assessments. They did not respond to the consultation request.

The decision was taken in accordance with our guidance.

Environmental risk

We have reviewed the operator's assessment of the environmental risk from the facility.

The operators risk assessment was unsatisfactory and required additional Environment Agency assessment.

See the sections above for more information. We were unable to fully assess all elements of the operators' risk assessment during determination of the application. The sludge treatment activities are existing and have not been previously regulated as an installation. We have set a number of improvement conditions requiring the Operator to submit updated and finalised assessments in a number of areas; including but not limited to the following:

Secondary Containment:

A fully worked up finalised secondary containment assessment in accordance with published guidance, validated and signed off by competent individuals using the methodologies set out in CIRIA C736 and BAT requirements most notably BAT conclusion 19 of the Waste Treatment BREF/BAT conclusions specifically referencing secondary containment.

Enclosure of open processes / tanks:

Improvement conditions have been included in the permit to ensure that any legacy open processes are to be appropriately enclosed and connected to odour abatement. Where biogas is still being produced, a process is to be connected to the gas infrastructure. Where tanks are potentially biologically active (post AD), to determine how these open processes need to be managed, the improvement programme seeks to understand the stability of the produced digestates and residual biogas potential. The results will demonstrate the level of abatement required, and/or optimisation of digester processes. or connection to site gas management infrastructure. Tanks pre-AD will need to be enclosed and if required abated.

Emissions of process wastewater:

The installation activities generate process wastewater. Effluent arises from pre-treatment operations such as sludge dewatering and thickening as well as post-treatment (via anaerobic digestion) where final dewatering occurs using centrifuges. These emissions are discharged to the adjacent WwTW for treatment. However, the emission characteristics have not been characterised through sampling and analysis at the time of the application. BATc 3 is to establish and maintain an inventory of wastewater streams including (from the Waste Treatment BREF/BAT conclusions):

- (i) *information about the characteristics of the waste to be treated and the waste treatment processes, including:*
 - a. *simplified process flow sheets that show the origin of the emissions;*
 - b. *descriptions of process-integrated techniques and waste water/waste gas treatment at source including their performances;*
- (ii) *information about the characteristics of the waste water streams, such as:*
 - a. *average values and variability of flow, pH, temperature, and conductivity;*
 - b. *average concentration and load values of relevant substances and their variability (e.g. COD/TOC, nitrogen species, phosphorus, metals, priority substances/micropollutants); (*
 - c. *data on bioeliminability (e.g. BOD, BOD to COD ratio, Zahn-Wellens test, biological inhibition potential (e.g. inhibition of activated sludge)) (see BAT 52);*

To ensure that the wastewater streams are fully characterised and an analysis of any pollutants of concern are undertaken, we have included improvement conditions (IC19a, IC19b and IC19c) requiring a sampling programme, analysis, and proposals for any additional measures required to prevent or minimise any significant emissions from the installation along with timescales

for implementation. BAT associated emission levels (BAT-AELs) have been applied to the emission points S1, S2, S3, S4 on the permit. The limits apply if a pollutant of concern is identified in the wastewater characterisation. The emission limits can be found in table S3.2 of the permit.

General operating techniques

We have reviewed the techniques used by the operator and compared these with the relevant guidance notes and we consider them to represent appropriate techniques for the facility.

Where there are measures approaching BAT, we have where appropriate implemented an improvement programme. The improvements set out in table S1.3 must be completed by the times stipulated in that table or the backstop conditions identified in the permit.

We have reviewed the techniques against the Best Available Techniques (BAT) Reference Document for Waste Treatment (BAT conclusions), Biological waste treatment: appropriate measures for permitted facilities - 1. When appropriate measures apply - Guidance - GOV.UK (www.gov.uk) and Non-hazardous and inert waste: appropriate measures for permitted facilities.

The operating techniques that the operator must use are specified in table S1.2 in the environmental permit.

Operating techniques for emissions that do not screen out as insignificant

Indirect emissions to water arising from sludge treatment operations cannot be screened out as insignificant due to insufficient information available at the time of determination of the permit. To establish if any emissions are of significance or may have an impact on the receiving waters, we have included improvement conditions that provide a framework for the operator to carry out sampling, analysis and to submit proposals to prevent or minimise any significant emissions from the installation along with timescales for implementation, with proposals to be implemented as approved. The permit includes the emission limits for substances with BAT associated emission levels (BAT-AEL). The limits apply if the sampling program identifies the listed substances as present in the discharge (emission point S1, S2, S3 and S4). The parameters and limits may be found in table S3.2 of the permit.

The permit conditions enable compliance with relevant BAT reference documents (BREFs) and BAT Conclusions, and Emission Limit Values (ELVs) deliver compliance with BAT-AEL. We consider that the emission limits included in the installation permit reflect the BAT for the sector.

National Air Pollution Control Programme

We have considered the National Air Pollution Control Programme as required by the National Emissions Ceilings Regulations 2018. By setting emission limit values in line with technical guidance we are minimising emissions to air. This will aid the delivery of national air quality targets. We do not consider that we need to include any additional conditions in this permit.

Odour management

We have reviewed the odour management plan in accordance with our guidance on odour management.

We consider that the odour management plan is satisfactory and we approve this plan.

We have approved the odour management plan as we consider it to be appropriate measures based on information available to us at the current time. The operator should not take our approval of this plan to mean that the measures in the plan are considered to cover every circumstance throughout the life of the permit.

The operator should keep the plans under constant review and revise them annually or if necessary sooner if there have been complaints arising from operations on site or if circumstances change. This is in accordance with our guidance 'Control and monitor emissions for your environmental permit'.

While we consider that the plan is satisfactory, we have included improvement condition (IC23) for the addition of abatement for the SAS GBT building and improvement condition (IC24a) to review the effectiveness of the abatement system. The improvement condition is included in order to determine whether existing measures have been effective and adequate to prevent and/or minimise emissions released to air. Where further improvements are identified, the operator is required to implement these measures in accordance with Environment Agency approval.

The plan has been incorporated into the operating techniques S1.2.

Use of conditions other than those from the template

Based on the information in the application, we consider that we need to include conditions other than those in our permit template. See sections 4 and 5 above for more details on the bespoke permit conditions we have set in this permit.

Raw materials

We have specified limits and controls on the use of raw materials and fuels.

Waste types

We have specified the permitted waste types, descriptions and quantities, which can be accepted at the regulated facility.

We are satisfied that the operator can accept these wastes for the following reasons:

- they are suitable for the proposed activities
- the proposed infrastructure is appropriate; and

the environmental risk assessment is acceptable

Improvement programme

Based on the information on the application, we consider that we need to include an improvement programme. See the sections above for more details on the bespoke permit conditions we have set in this permit.

Emission Limits

Emission Limit Values (ELVs) and equivalent parameters or technical measures based on Best Available Techniques (BAT) have been added for emissions to air and indirect discharges of waste water to surface waters.

Emission limit values are derived from:

- Waste Treatment BREF for BAT associated emission limits.
- Schedule 25A of the Environmental Permitting (England and Wales) (Amendment) Regulations 2018.

Emissions to air

There are point source emissions to air from the SAS GBT building via a vent (emission A59) which is subject to improvement condition IC23 to provide abatement as the air emissions are currently untreated. BAT requires that BAT-AELs of 20 mg/Nm³ for Ammonia (NH₃) be applied when biological treatment of waste is carried out. Anaerobic digestion is a biological process - therefore the limit is included in the permit.

The Waste Treatment BREF provides examples of wastes that would be considered as water-based liquid wastes. These include wastes under the

category '19 08 wastes from waste water treatment plants not otherwise specified'. As there are channelled emissions of odorous air from the treatment of these wastes within the SAS GBT Building at emission point A59 we have included BAT-AELs of 5 mg/Nm³ Hydrogen Chloride (HCL) and 20 mg/Nm³ of Total Volatile Organic Compounds (TVOC). It should be noted that the limits for HCL and TVOC only apply when the substances of concern are identified in the waste gas streams characterised in BAT conclusion 3. Improvement condition IC24a requires full investigation and characterisation of waste gas streams within 6 months of issue of the permit. A full characterisation of waste gas streams was not available at the time of submission of the application.

Combustion appliances

Biogas is produced as a result of the AD process. Combustion of the produced biogas takes place in five combined heat and power (CHP) engines. The Combustion plant produces heat and electricity that may be used to power on site processes while a boiler fuelled on natural gas provides additional heat to the AD processes. Combustion of biogas and natural gas discharges pollutants to the air via stacks and exhausts. We have therefore applied emission limits to the following substances;

- Nitrogen oxides
- Sulphur dioxide
- Carbon monoxide

For further detail of emission limits, refer to table S3.1 of the permit.

Emissions to water

There are no emissions of waste waters direct to a receiving water body. The operator will discharge waste waters to the waste water treatment works prior to discharge to the Severn Estuary. The Waste Treatment BREF specifies BAT AELs for indirect emissions to a water body. Where non-hazardous wastes are imported for storage, blending or treatment prior to discharge into the wastewater treatment works, the permitted waste operation ceases once the waste is mixed with the waste waters in the WwTW. BAT AELs or emission limits will be applied to the discharge into the wastewater treatment works for substances of concern.

The BAT AELs are appropriate for the activity defined under the BREF as 'Treatment of water-based liquid waste'. The BREF provides examples of wastes that would be considered as water-based liquid wastes. These include wastes under the category '19 08 wastes from waste water treatment plants not otherwise specified'. The treatment of this waste including dewatering, thickening, treatment through AD and the subsequent discharge to the waste

water treatment works will be subject to the BAT AELs specified within BAT conclusion 20 (Table 6.2 of the Waste Treatment BREF).

As outlined within the section 4 above, *Indirect emissions of waste water*, the operator did not provide a composition of the waste water (in line with BAT conclusion 3), therefore, all BAT AELs have been applied. We have set improvement condition (IC19a) for the operator to determine the composition of the waste in a waste inventory. The limits will only apply when the substance concerned is identified as relevant in the waste water inventory.

Until the operator has completed IC19a, the permit specifies limits for:

- Hydrocarbon oil index (HOI) (mg/l).
- Free cyanide (CN⁻) (mg/l).
- Adsorbable organically bound halogens (AOX) (mg/l).
- Metals and metalloids; arsenic (expressed as As), cadmium (expressed as Cd), chromium (expressed as Cr), hexavalent chromium (expressed as Cr(VI)), copper (expressed as Cu), lead (expressed as Pb), nickel (expressed as Ni), mercury (expressed as Hg), zinc (expressed as Zn) (µg/l).

Monitoring

We have decided that monitoring should be carried out for the parameters listed in the permit, using the methods detailed and to the frequencies specified.

We made these decisions in accordance with waste treatment Best available techniques BAT conclusions.

Based on the information in the application we are satisfied that the operator's techniques, personnel and equipment have either MCERTS certification or MCERTS accreditation as appropriate.

Reporting

We have specified reporting in the permit.

We made these decisions in accordance with the Waste Treatment BAT conclusions.

Management System

We are not aware of any reason to consider that the operator will not have the management system to enable it to comply with the permit conditions.

The decision was taken in accordance with the guidance on operator competence and how to develop a management system for environmental permits.

Technical Competence

Technical competence is required for activities permitted.

The operator is a member of the ESA/EU skills scheme.

We are satisfied that the operator is technically competent.

Previous performance

We have assessed operator competence. There is no known reason to consider the operator will not comply with the permit conditions.

We have checked our systems to ensure that all relevant convictions have been declared.

Relevant convictions were found and declared in the application. We considered relevant convictions as part of the determination process.

Financial competence

There is no known reason to consider that the operator will not be financially able to comply with the permit conditions.

Growth duty

We have considered our duty to have regard to the desirability of promoting economic growth set out in section 108(1) of the Deregulation Act 2015 and the guidance issued under section 110 of that Act in deciding whether to grant this permit.

Paragraph 1.3 of the guidance says:

‘The primary role of regulators, in delivering regulation, is to achieve the regulatory outcomes for which they are responsible. For a number of regulators, these regulatory outcomes include an explicit reference to development or growth. The growth duty establishes economic growth as a factor that all specified regulators should have regard to, alongside the delivery of the protections set out in the relevant legislation’.

We have addressed the legislative requirements and environmental standards to be set for this operation in the body of the decision document above. The

guidance is clear at paragraph 1.5 that the growth duty does not legitimise non-compliance and its purpose is not to achieve or pursue economic growth at the expense of necessary protections.

We consider the requirements and standards we have set in this permit are reasonable and necessary to avoid a risk of an unacceptable level of pollution. This also promotes growth amongst legitimate operators because the standards applied to the operator are consistent across businesses in this sector and have been set to achieve the required legislative standards.

Annex 8 - Consultation Responses

The following summarises the responses to consultation with other organisations, our notice on GOV.UK for the public, and the way in which we have considered these in the determination process.

Responses from organisations listed in the consultation section:

Response received from UK Health Security Agency (UKHSA)

Brief summary of issues raised:

The main emissions of potential concern are odour and bioaerosols. It is noted that the applicant performed baseline bioaerosol emission monitoring from site.

Details of mitigation measures to reduce bioaerosol and odour emissions from the site are provided by the applicant. Based on the information contained in the application supplied to us, UKHSA has no significant concerns regarding the risk to the health of the local population from the installation.

Summary of actions taken:

We have placed emission limits and monitoring requirements in permit in line with BAT. We have assessed the operators air modelling and agree with their conclusion that the impact to both human and ecological receptors is likely to be not significant.

We have assessed the operators site specific bioaerosols risk assessment and have concluded that the only bioaerosols sources are the Biofilter from the food waste reception as there are no open cake pads included within the permit boundary for these operations. The biofilter for the food waste is not within the screening distance of 250m from the nearest sensitive receptor and so under guidance: [M9 environmental monitoring of bioaerosols at regulated facilities](#) we have assessed that the requirement to monitor for bioaerosols is not necessary due to the low risk of emissions leaving the site boundary.

The operator is required to have an Odour Management Plan which we have approved and incorporated into the operating techniques of the permit (Table S1.2). Furthermore, we have inserted an Improvement Condition in the permit which requires the operator to review the effectiveness of the abatement systems as well as improvement conditions to enclose open tanks and assets. The improvement conditions are included in order to determine whether existing measures have been effective and adequate to prevent and/or minimise emissions released to air and to ensure the enclosure of tanks with adequate odour abatement is undertaken in compliance with the permit.

We are satisfied that sufficient steps have been taken regarding the approach to both the inclusion of ongoing monitoring requirements and the implementation of improvements conditions drafted into the permit in accordance with the relevant guidance. We have set emission limits within the permit in line with BAT.