



Justification of Additional EWC Codes - Permit Variation (2023)

As part of our EA Permit Variation / Installation application, Waste4Generation are applying for the addition of 4 additional EWC codes to the permit:

<i>EWC Codes to be Added to Permit</i>	
19 07 03	19 12 12
16 01 15	16 03 06

Addition of EWC 19 07 03

Waste4Generation have conducted considerable research & development into providing a sustainable treatment process for non-hazardous landfill leachates and understanding their suitability for anaerobic digestion. The EWC is characterised as follows:

Chapter	Characterisation
19	Materials from Waste & Water Treatment
07	Landfill Leachate
03	Landfill Leachate Other than those mentioned in 19 07 02(Non Hazardous)

Waste4Generation have conducted a full Jacob's technical assessment of EWC 19 07 03 and the viability of the waste streams and found it suitable for our process. In addition, Waste4Generation as part of our previous variation undertook a pre-app discussion (2018) in regards to non-hazardous leachate treatment and have addressed the following considerations below:

Key Considerations in regards to Leachate Treatment:

1. Storage & Transfer Conditions

As our site specialises in liquid-based anaerobic digestion, all waste is received into reception tanks, sealed vessels, which have carbon scrubbers on the top of the tanks for air which is displaced from the tank as filling occurs. All tankers connect through sealed pipework and all tanks are fully bunded and situated within bunded areas. Any spillages are cleaned up immediately as per our operating procedures within our Environmental Management System.

Our entire process is within sealed vessels (for the anaerobic treatment), and there are numerous methods in place for the treatment of any potential dissolved methane within the system (see



below). The sealed tanks prevent leakages, and the EA standard bund would capture any potential spillages. The site has undertaken a CIRIA 736 assessment in regards to containment, and the risk to local receptors from a spillage on site was found to be low. The entire site's drainage is fully enclosed so that all run-off from site is captured and pumped back to reception tanks so that only treated effluent leaves site. The final effluent treatment process has been upgraded with considerable tertiary treatment to remove dissolved methane and other constituents following the AD process.

The upgrades to Waste4Generation's facility to meet BAT requirements ensure rigorous testing of incoming waste streams and full characterisation ensuring that waste streams.

2. Odour

As part of our pre-application considerations as well as Waste4Generation's upgrades to Installation facility, the Odour Abatement system onsite is to be upgraded with the implementation of new process and equipment. Waste4Generation has also amended and updated our Odour Management Plan. An Odour Risk Assessment and Bioaerosol Risk Assessment have been undertaken and found that with the implementation of the odour abatement system, the risk to local receptors is low. Waste4Generation's pre-acceptance and acceptance procedures prevent the acceptance of highly odorous waste, and highly odorous tankers are to be rejected as part of our acceptance procedure. These have been upgraded to achieve BAT requirements and also inline with the Environment Agency's 'Appropriate Measures'.

As discussed within the storage section, all storage & processing tanks are sealed, and there is odour abatement at all points of odour emission identified. We have procedures in place for the monitoring of the carbon scrubbers to ensure that they are performing sufficiently, and that the carbon is changed where required.

Our process is a high-rate process, and therefore the tankered waste is treated typically treated within 24 hours through our reactors and is discharged via enclosed pipework to sewer. Waste4Generation has both secondary & tertiary treatment processes following the anaerobic digesters including nano-bubble & ozone treatment to provide sufficient effluent treatment to attain consent compliance and odour abatement.

3. Waste Acceptance Procedures

Waste4Generation's pre-acceptance and acceptance procedures have been reviewed and upgraded in line with BAT techniques and along with the Environment Agency's 'Appropriate Measures' which characterise a waste thoroughly and ensure it's viability to the site prior to pre-acceptance and acceptance approvals.

4. Jacob's Assessment

Please find enclosed Jacob's framework assessment for the treatment of landfill leachates under EWC 19 07 03.



5. Abatement Review

The site's abatement is to be upgraded as the site is upgraded to an Installation facility. The Odour Management Plan has also been reviewed, and both an Odour Risk Assessment and Bioaerosol Risk Assessment have been undertaken and found the risk to local receptors to be low.

Additional Considerations:

1. Dissolved Methane

Dissolved methane has been observed in low concentrations within the leachate samples, where samples have not seen a peak over 5 mg/L. As our system of high rate anaerobic digestion is already designed for the production, collection and treatment of dissolved methane, these levels are within the treatment range of Waste4Generation's secondary and tertiary treatment. Anaerobic digestion itself generates dissolved methane as well as methane gas, and our methane stripper (as part of the centralised abatement system and final effluent treatment process) is highly efficient at maintaining consent compliance. The site's effluent is routinely tested for dissolved methane as part of consent compliance from Anglian Water and has always been found to be compliant in regards to dissolved methane.

The leachate like the other liquid waste streams will be received within sealed tanks and processed via the anaerobic digesters. The anaerobic digesters contain an efficient de-gassing system which separates dissolved methane produced from anaerobic digestion, separately the dissolved methane from the effluent within the reactor, and the biogas is removed from the reactors via the gas line.

The site's DSEAR assessment has included the presence of dissolved methane, ensuring safe treatment on site and also determined that the treatment methods in place ensure that our treated effluent that is discharged to sewer is safe for any Anglian Water / sewerage works which may take place. Our trade effluent consent does not contain a dissolved methane requirement, however nationally the limit of 0.14 mg/L is generally adopted, of which our treatment process can efficiently achieve.

2. Details on De-sulphurisation prior to engines & sewer discharge

Hydrogen Sulphide is removed via a scrubber which is connected directly to our gas line off of the reactors. This is detailed within the Odour Management System and within the EMS.

In order to meet the trade effluent consented limits, Waste4Generation has both secondary and tertiary effluent treatment following the anaerobic digesters, utilising nano bubbles & ozone where required to ensure sulphide limits are met. Additionally, there are sulphate and sulphide limits set on both pre-acceptance and acceptance criteria to help protect the site from high incoming levels of sulphur.



Reactor conditions are optimised for the waste stream to ensure that conversion of sulphate to sulphide are optimised and minimised. There is ferric dosing in place throughout the reactors to reduce and react with sulphide within the reactors.

Addition of EWC 19 12 12

Waste4Generation as part of this permit variation / Installation application request to add the EWC 19 12 12, which is a standard rule permit for Anaerobic Digestion approved EWC Code (SR2021 No.6). The suitability of this EWC code for AD has already been determined, and is viable to Waste4Generation’s treatment process.

Chapter	Characterisation
19	Materials from Waste & Water Treatment
12	Mechanical Treatment of Waste
12	Other Wastes (including mixtures of materials) from mechanical treatment of wastes other than those mentioned in 19 12 11.

Addition of EWC 16 01 15

Following Waste4Generation’s 2018 pre-app for permit variation, the site determined the viability to sustainably treatment non-hazardous anti-freeze liquids (glycols). The characterisation of the EWC code is as follows:

Chapter	Characterisation
16	Other wastes from Industrial Processes
01	Wastes from Vehicles / End of Life
15	Anti-freeze liquids other than those mentioned in 16 01 14 (Non-Hazardous)

As part of the work and research undertaken as part of this application, Waste4Generation undertook a pre-application meeting to fully understand any EA recommendations in regard to the addition of both the leachate EWC code as well as the non-hazardous anti-freeze EWC code.



Key Considerations in regard to Non-hazardous Antifreeze Treatment:

1. Storage & Transfer Conditions

As our site specialises in liquid-based anaerobic digestion, all waste is received into reception tanks, sealed vessels, which have carbon scrubbers on the top of the tanks for air which is displaced from the tank as filling occurs. All tankers connect through sealed pipework and all tanks are fully bunded and situated within bunded areas. Any spillages are cleaned up immediately as per our operating procedures within our Environmental Management System.

Our entire process is within sealed vessels (for the anaerobic treatment), and there are numerous methods in place for the treatment of any potential dissolved methane within the system (see below). The sealed tanks prevent leakages, and the EA standard bund would capture any potential spillages. The site has undertaken a CIRIA 736 assessment in regards to containment, and the risk to local receptors from a spillage on site was found to be low. The entire site's drainage is fully enclosed so that all run-off from site is captured and pumped back to reception tanks so that only treated effluent leaves site. The final effluent treatment process has been upgraded with considerable tertiary treatment to remove dissolved methane and other constituents following the AD process.

The upgrades to Waste4Generation's facility to meet BAT requirements ensure rigorous testing of incoming waste streams and full characterisation ensuring that waste streams.

2. Odour

As part of our pre-application considerations as well as Waste4Generation's upgrades to Installation facility, the Odour Abatement system onsite is to be upgraded with the implementation of new process and equipment. Waste4Generation has also amended and updated our Odour Management Plan. An Odour Risk Assessment and Bioaerosol Risk Assessment have been undertaken and found that with the implementation of the odour abatement system, the risk to local receptors is low. Waste4Generation's pre-acceptance and acceptance procedures prevent the acceptance of highly odourous waste, and highly odourous tankers are to be rejected as part of our acceptance procedure. These have been upgraded to achieve BAT requirements and also inline with the Environment Agency's 'Appropriate Measures'.

As discussed within the storage section, all storage & processing tanks are sealed, and there is odour abatement at all points of odour emission identified. We have procedures in place for the monitoring of the carbon scrubbers to ensure that they are performing sufficiently, and that the carbon is changed where required.

Our process is a high-rate process, and therefore the tankered waste is typically treated within 24 hours through our reactors and is discharged via enclosed pipework to sewer. Waste4Generation has both secondary & tertiary treatment processes following the anaerobic



digesters including nano-bubble & ozone treatment to provide sufficient effluent treatment to attain consent compliance and odour abatement.

The non-hazardous anti-freezes sampled all were very low odour, and therefore we do not anticipate any problems with odour caused by accepting this waste stream, however we have reviewed procedures to ensure permit compliance.

3. Waste Acceptance Procedures

Waste4Generation's pre-acceptance and acceptance procedures have been reviewed and upgraded in line with BAT techniques and along with the Environment Agency's 'Appropriate Measures' which characterise a waste thoroughly and ensure it's viability to the site prior to pre-acceptance and acceptance approvals.

4. Jacob's Assessment

Please find enclosed Jacob's framework assessment for the treatment of EWC 16 01 15 (non-hazardous antifreezes).

5. Abatement Review

The site's abatement is to be upgraded as the site is upgraded to an Installation facility. The Odour Management Plan has also been reviewed, and both an Odour Risk Assessment and Bioaerosol Risk Assessment have been undertaken and found the risk to local receptors to be low. We have conducted an abatement review of our site, and can confirm that both the controls, abatement infrastructure and protocols in place are sufficient for the treatment of non-hazardous anti-freeze liquids at W4G Corby.

Additional Considerations (Pre-App 2018):

6. Dissolved Methane

Not applicable to non-hazardous anti-freeze wash waters.

7. Details on De-sulphurisation prior to engines & sewer discharge

The antifreeze wash waters sampled all contained very low levels of sulphate and sulphide, and therefore the concentrations of sulphide to be generated in the treatment of this waste stream, both present in the treated effluent and the biogas produced would be within the plant treatment parameters, for both the scrubbing unit prior to the engine and secondary & tertiary treatment of the final effluent to ensure consent compliance.



Addition of EWC 16 03 06

Waste4Generation has undertaken viability studies on organic wastes from Off-specification batches and unused products. With the permit variation to include additional mechanical processing and the generation of bespoke feedstock through the tank farm, this type of waste stream is particularly viable for sustainable waste treatment, recovery and diversion from landfill.

Chapter	Characterisation
16	Other wastes from Industrial Processes
03	Off-specification Batches and Unused Products
06	Organic Wastes other than those mentioned in 16 03 05 (Non-hazardous)s

Waste4Generation have done full viability and Jacob's assessment on these waste streams and found them to be suitable for Waste4Generation Corby's treatment processes and recovery.