

Version: 1.1
Document Reference: Wastewater and Waste Gas Streams Inventory
Date created: 29/06/26

Waste Water and Gas Streams Inventory

1. Introduction

Duranta Teesside Limited operate an anaerobic digestion (AD) biogas facility at Forty Foot Road, Middlesbrough, TS2 1HG. The plant operates according to environmental permit reference EPR/YP3236RW. The plant is in the process of undergoing an expansion of current site operations to achieve processing of the full waste tonnages allowed under the current permit. BAT conclusion number 3 of the current BAT conclusions for waste treatment operations specifies that it is BAT to establish and maintain an inventory of wastewater and waste gas streams as part of the site EMS. This inventory has been updated to take into account the currently proposed expansion of the site.

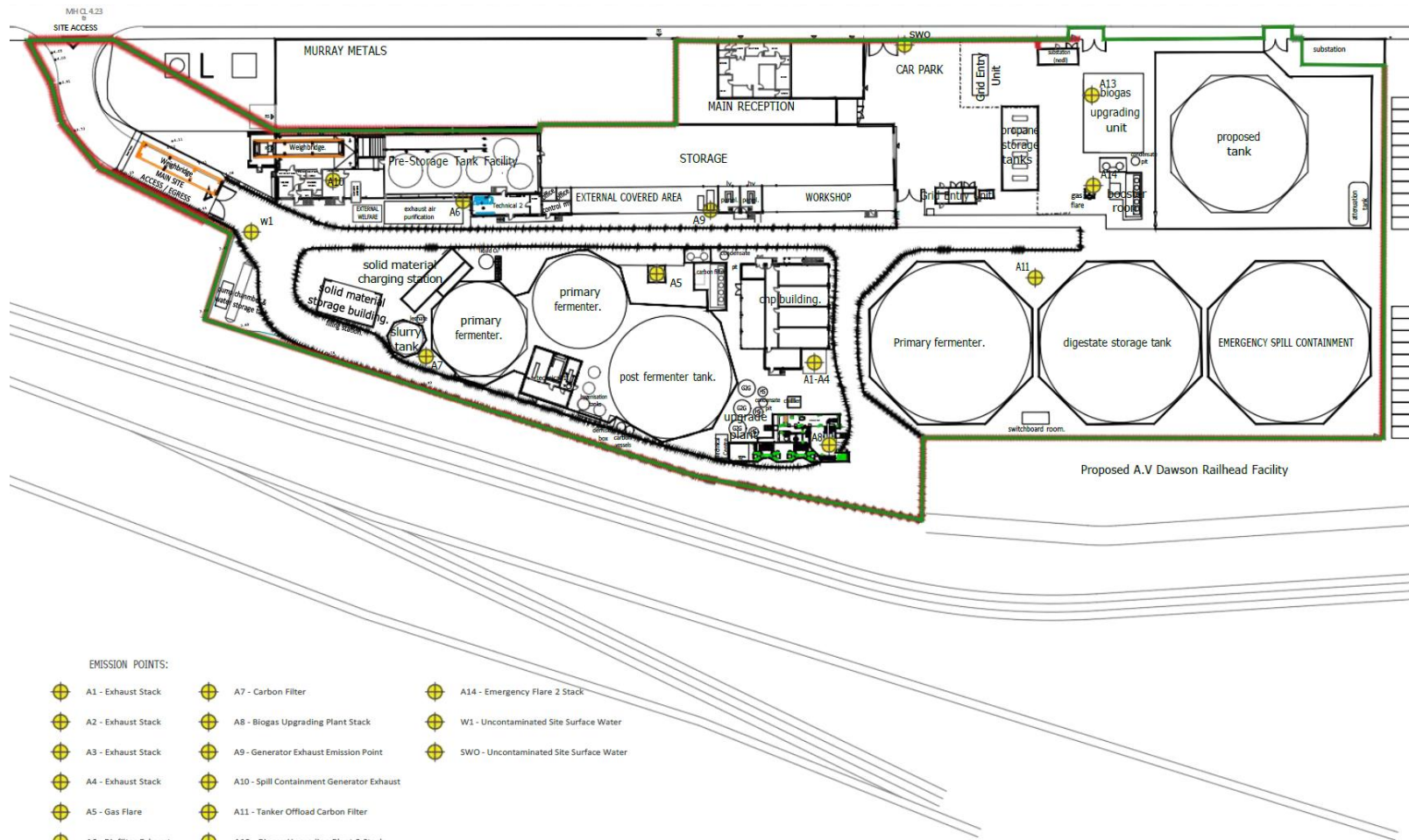
Although there is a significant amount of detail on wastewater and gas streams imbedded in the current EMS documentation, it has been identified that a specific inventory is required to allow the operator to monitor their management of these various material streams and to facilitate reduction in emissions where possible.

2. Emissions Points and Process Flow

The updated site layout boundary and emissions points plan prepared to support the most recent permit variation for the site provides a summary of the current point source emissions to air and water. In addition to those listed, there are a series of emergency under/over pressure relief valves installed on the site tanks and listed in the site permit.

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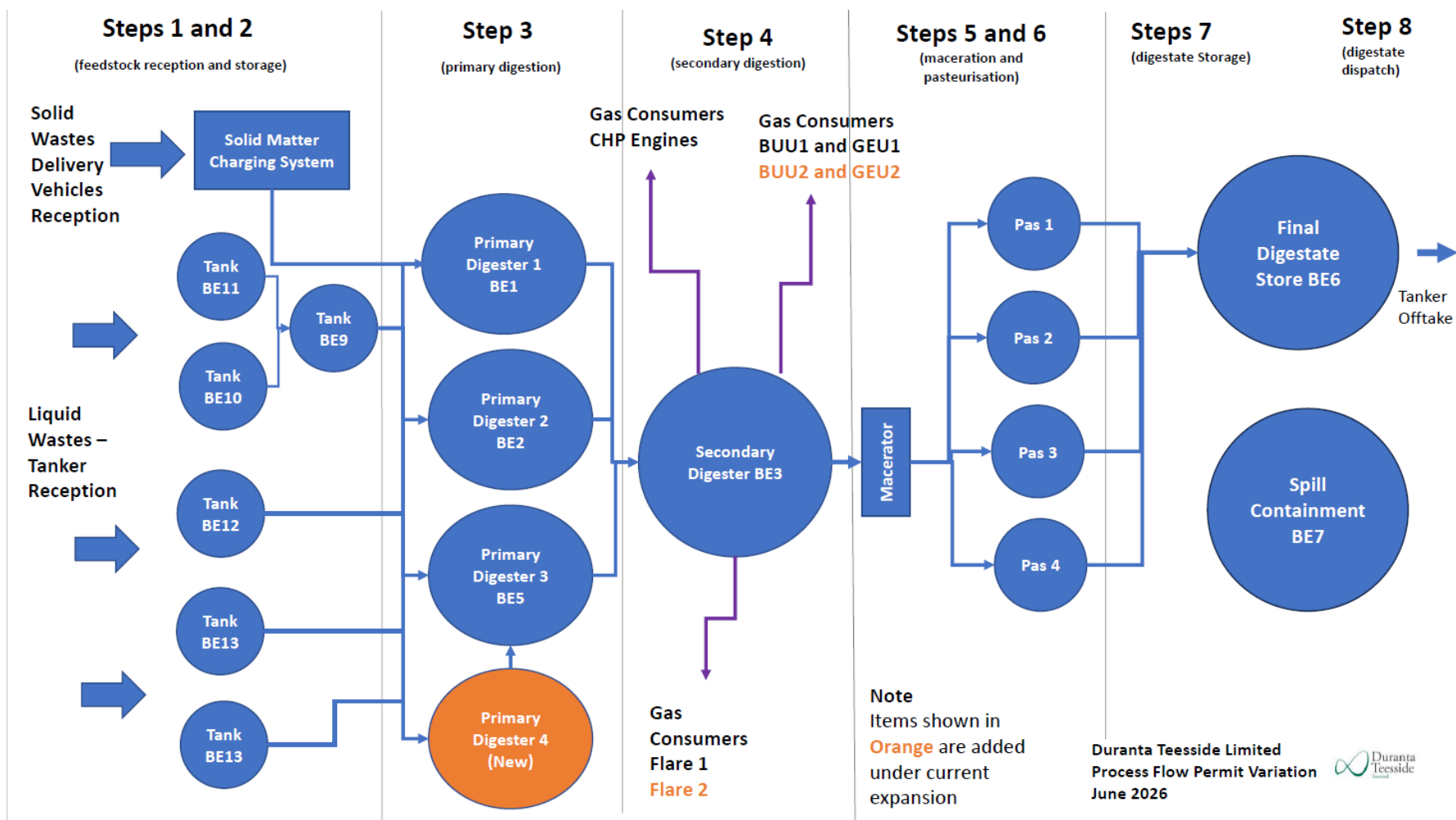


Site Emissions Plan – CB2255-04

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A process flow diagram showing the expanded operations is shown below and is document reference CB2255-04c



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3. Wastewater and Waste Gas Streams Inventory

Following review of the current site emissions points, of the process flow and description based on the proposed expansion of operations at the site, an inventory of wastewater and waste gas streams arising from the process has been identified and is outlined in Table 1 below. Full details of wastewater and gas streams analysis parameters and volumes generated have not been included in Table 1 itself, but reference has been given in column 6 outlining the detailed data that is captured in this regard in the wider EMS, and where this data can be found.

Table 1 – Wastewater and Waste Gas Streams Inventory

	Material Stream	Emission Point Associated	Description of Waste Gas/Water Stream	Characteristics/variability of generation and nature of material	Location of Data Reference/Qualitative Data	Final Fate of Gas/Water Stream
1	Biogas.	Emergency Pressure Relief Valves on Digester Tanks and PAS Tanks	Biogas vented to atmosphere from valves during emergency conditions to avoid over pressure situations.	Very infrequent release short term occurrence only during emergency operational conditions. Use is subject to monitoring/reporting as laid out in site permit.	Characteristics of biogas recorded on SCADA system/KPI monitoring sheets based on in situ gas analyser data.	Biogas vented to atmosphere during emergency operations.
2	Foaming Digestate.	Foaming release valves for release of foaming digestate in emergency conditions	Foaming digestate released into the site containment system at a low level from foam release valves.	Very infrequent release short term occurrence only during emergency operational conditions. Event would be associated with atypical conditions at the site and would lead to	Sample analyses of digestate in digesters undertaken for ongoing process monitoring purposes kept in site lab records. This material	Foaming digestate to be removed from the containment collection system by tanker and either re-processed through the plant or sent for

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				implementation of incident investigation and reporting procedures.	will be Cat 3 ABP as release point is prior to pasteurisation.	disposal processing at a third-party site that is approved to accept Cat 3 ABP. Cleaning and disinfection in accordance with site HACCP.
3	Combustion Exhaust Gases.	A1-A4 - CHP Engines A5 and A14 - Emergency flare stacks A10 Spill Containment Generator Exhaust A9 Generator Exhaust	Exhaust from CHP's and Flare which burn biogas.	CHP's in continuous use during operations and subject to monitoring/ELV's as specified on permit. Flares only used in emergency situations and use is subject to monitoring and reporting as laid out in site permit.	CHP engine exhausts subject to sampling/monitoring exercise on an annual basis. Reports retained in the site EMS and reported against ELV's to EA on annual reporting as required by site permit.	Biogas combustion exhaust emissions vented to atmosphere (NO ₂ , SO ₂ , CO, VOC's).
4	Displaced air/gas from liquid waste tank and digestate storage tank headspace.	Emissions from current liquid waste reception tanks are contained and channelled through an abatement unit before being released to atmosphere. A6 and A7	Characteristic of the liquid stored in the tank (digestate/food waste).	Vented to atmosphere on tank filling via an abatement unit. Emissions will depend on frequency and volumes of material added to the tank which is likely to be daily to weekly.	Emissions characteristic of food waste/digestate so anticipated that potentially following parameters.	Displaced air emission are passed through an abatement unit before release to atmosphere.

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	Material Stream	Emission Point Associated	Description of Waste Gas/Water Stream	Characteristics/variability of generation and nature of material	Location of Data Reference/Qualitative Data	Final Fate of Gas/Water Stream
					Odour Ammonia VOC's H ₂ S	
5	Vents from pasteurisers.	Pasteurisers are in continuity with the gas line so no emissions releases	Emissions from heating digestate which occur when a batch of digestate is pasteurised.	Hot and moist emissions from heated digestate. Potential for odours, condensate, ammonia and other biogas elements to be present.	Emissions not routinely tested. SCADA system records timing and duration of pasteurisation batches.	Gases maintained in the sealed gas tight gas storage and collection system in the tank headspace.
6	Condensate.	No emissions point.	Arising from gas line and removed during gas scrubbing operations prior to combustion in the CHP's and upgrading. Could be elevated in biogas components.	Produced in small quantities continuously while gas line in use and gas consumers in operation. Condensate likely to be elevated in biogas components.	Not subject to analysis.	Condensate is collected in a dedicated collection system and re-circulated in the process.
7	Off spec biogas from	Burnt in the emergency flares A5 and A14 or returned to gas storage.	Off spec upgraded biogas/biomethane	Will depend on the point in the process when the gas is	SCADA monitoring system will record occurrences of gas	Burnt in one of the emergency flares, or

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	upgrading process			rejected. May be propenated.	being returned or off spec.	returned to gas storage.
8	CO ₂ from upgrading process	A8 and A13 – biogas upgrading unit CO ₂ vents	CO ₂ removed from biogas in the upgrading units x2.	May contain trace amounts of VOC's /methane slip	Six monthly LDAR campaigns. SCADA records for BUU performance/flow metres.	Released to atmosphere on an ongoing basis.
9	Surface Water from Roadways and Clean Process Areas.	W1 and SWO surface water release points.	Clean surface water from the concrete process areas is collected in a drainage collection system and stored in a containment tank. Water is tested prior to release to surface water sewer. Clean water from clean roadways is discharged from site to surface water directly without testing.	Volumes be dependent on rainfall and requirement for the process. Potential contamination is determined by the nature and management of material kept at the site and presenting operational conditions. Parameters tested and benchmark thresholds for release are specified in management system.	Surface water arising from the process containment area is subject to testing before being discharged to surface water sewer. Testing undertaken in accordance with permit requirements Records of testing kept in the site lab.	If water is below agreed benchmarks, it can be released to surface water sewer. If it fails to meet these benchmarks it is re-circulated in the process.

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	Material Stream	Emission Point Associated	Description of Waste Gas/Water Stream	Characteristics/variability of generation and nature of material	Location of Data Reference/Qualitative Data	Final Fate of Gas/Water Stream
10	Contaminated surface water runoff from process areas.	No emissions point	Potential for elevated levels of COD, BOD, Suspended solids, ammonia and phosphates. Could also contain oils from machinery and vehicles.	Dependant on rainfall and events/activities occurring during site operations.	Not subject to routine analysis. Will be subject to analysis as the wastewater stream is generated if necessary to determine suitable end fate. If benchmark thresholds are exceeded then the water will be regarded as contaminated.	Collected in a sealed tank and re-circulated for use in the process or sent for disposal or processing at a third-party site. The material may need to be handled as Cat 3 ABP depending on the circumstances of generation. Cleaning and disinfection in accordance with site HACCP if required.
11	Final Digestate.	No emissions point	Digestate arising from the process. Material is routinely PAS110 certified, and quality of material recorded according to sampling regime outlined in the standard. It is possible that digestate could be	Produced on a continuous basis. Final digestate is Cat 3 derived material and complies with the PAS110:2014 standard. It is possible that off spec batches could occur and fall out of certification.	Routine PAS110 sample analysis suite undertaken at least every 3 months and retained on file in the operators EMS. Routine APHA samples undertaken for E. Coli and Salmonella retained on file in operators EMS.	Material stored short term on site in storage tank, and then tankered away for further interim storage or direct application to land as an agricultural fertiliser. Off spec batches that fail to comply with the PAS110 standard

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			out of spec following routine sample failure.			will not be certified material and will be either subject to disposal, re-processing, or use on land for agricultural benefit as a waste under agreement with the EA (landspreading deployment).
12	Spent and surplus digestate samples.	No emissions point.	Liquids arising from onsite lab tests – digestate samples.	Only small amounts generated daily. Surplus digestate samples. If sample taken upstream of the pasteurisers, the material will be Cat 3 ABP.	Surplus samples passed back into the process upstream of the pasteurisers. Data from process monitoring testing retained in the site lab testing records.	Surplus samples passed back into AD process upstream of pasteurisers.
13	Tank/site wash waters.	No emissions point	Potentially a mixture of water, cleaning agents, disinfectant, grit, stones, plastics and digestate. Likely to be ABP if	Only generated on a planned basis during tank maintenance activities.	Not subject to routine analysis.	Tank washings sent for disposal/recovery at suitable facility dependent on nature of the material.

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			generated from tanks located in the process pre-pasteurisation.			Material will be Cat 3 ABP and will be handled and disposed of as such.
14	Domestic sewage.	Discharged to public foul sewer.	Domestic sewage from staff welfare facilities at the site.	Produced daily in small volumes to support small onsite staff team canteen, toilets, showers, and washing machine facilities.	Not subject to routine analysis.	Discharged to public foul sewer.
15	Channelled emissions to air from odour abatement units.	A6 and A7– Emission point from biofilter and carbon filter	Extracted and treated air from waste storage areas. Anticipated to contain trace odour, VOC's, ammonia and H ₂ S. Biofilter emissions may also contain bioaerosols.	Extraction system will be operational continuously while plant is operational. Characteristics may have the potential to vary depending on weather conditions and on the waste types being treated at any one time.	Regular process monitoring of the odour abatement units will be undertaken as specified in the odour management plan. Regular routine monitoring of emissions to be undertaken and reported to the regulator as specified in the site permit (for ammonia, odour and H ₂ S and bioaerosols in the case of the biofilter).	Treated air emissions released to atmosphere.

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16	Vacuum tankers removing digestate from site.	A11 emissions from tanker offtake carbon filter.	Characteristic of final digestate. Air pumped from tanker on filling.	Rate of generation will vary depending on number of tanker offtake events during a day. Emissions likely to be characteristic of odour, ammonia, and VOC's.	Emissions are not currently tested. Tanker loads leaving the site will all be recorded and accompanied by dispatch paperwork which will be retained in the site records.	Treated air released via an odour abatement unit before being vented to atmosphere.

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