

Version: 1.1
Document Reference: Leak Detection and Repair Plan
Date created: 29/06/26

LEAK DETECTION AND REPAIR PLAN

Procedure Objectives

The Duranta Teesside AD facility operates under permit reference EPR/ YP3236RW.

Sections 3.2.4 of the permit states the following.

'The operator shall implement a Leak Detection and Repair (LDAR) programme to detect and mitigate the release of volatile organic compounds, including methane from diffuse sources.'

In addition to this, table 3.3 of the permit specifies that diffuse emissions from all sources identified in the Leak Detection and Repair (LDAR) programme shall be subject to monitoring every 6 months in accordance with a written management system for presence of VOC's including methane.

Scope

This procedure outlines the measures to be undertaken at the Duranta Teesside AD site to comply with the site permit requirements and to monitor for leaks of volatile organic compounds arising from operations at the site.

The provisions in place include measures to undertake periodic assessments for gas leaks, and measures in place for ongoing daily monitoring for leaks.

In preparing this programme of activities, and selection of equipment to be used for optical imaging surveys, the operator has taken note of the various currently available standards (BS EN 17628 and BS EN 15446.)

Responsibility

The Plant Manager is responsible for ensuring that this procedure is adhered to, to ensure that at least six monthly LDAR assessments are undertaken, and to track corrective actions/repairs to completion.

Definitions

LDAR- Leak Detection and Repair

CHP – Combined Heat and Power Engine

VOC – Volatile Organic Compound

DSEAR – Dangerous Substances and Explosive Atmospheres Regulations 2002

PRV – Pressure Relief Valve

AD – Anaerobic Digestion

Associated Documents

Wastewater and Gas Streams Inventory

DSEAR Assessment and Site Zone Plan

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Daily Checks Procedure
Odour Management Plan
Plant Maintenance Schedule

Equipment

A third-party specialist contractor will provide calibrated equipment to carry out 6 monthly optical imaging assessments for presence of VOC's. The equipment used by the company is EyecGas 2.0 OGI Camera. License 1.0.1. TGC 220 33615. Software version: 2.6.0. Getac Tablet 8G9K0900.

Body worn personal gas monitors worn by staff on a day-to-day basis and subject to calibration as specified by the manufacturer.

Procedure

The following measures will be implemented at the site in order to monitor for gas leaks and allow for corrective actions to be undertaken in a timely fashion.

Measures for Day-to-Day Ongoing Monitoring and Reporting of VOC Leaks

All staff will be made aware of the potential for leaks of biogas and other VOC's to occur at the site and the need to report any occurrence or observation that may indicate that a leak has occurred. Staff will be provided with training in the findings of the DSEAR assessment including zone plans and the full inventory of volatile substances present at the site as outlined in the most recent DSEAR assessment report.

Site staff will wear gas monitors during day-to-day activities and daily checks and will report any alarms triggered whilst in use to the plant manager, as these may indicate the presence of leaks and indicate that further investigation is needed.

There are a range of activities that are undertaken by site staff on a daily or weekly basis during which the presence of leaks may become apparent. Staff undertake daily boundary sniff test monitoring for presence of odours. Although this activity is primarily intended to monitor and address nuisance from odours, the presence of gas leaks may also be identified during these monitoring activities.

Staff undertake regular maintenance of plant and equipment at the site, including checks of PRV's and general maintenance of plant and equipment. Staff may identify potential for leaks during these activities.

The CHP's and BUU units are located in containers that are equipped with fixed, in situ gas monitor which will alert staff should a gas leak be detected in the building.

Staff monitor the plant key performance indicators (KPI's) on an ongoing basis to monitor plant productivity and performance. This includes monitoring of the plant feed to gas conversion figures. Should there be a change in these figures, or if they are found to be lower than anticipated, then this may be indicative of the presence of leaks, and the need for further detailed investigation.

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Leak Detection and Repair Surveys (LDAR Survey)

A full site LDAR survey will be undertaken on at least a 6 monthly basis or more frequently if any of the ongoing monitoring activities listed above suggest that further investigation is needed sooner.

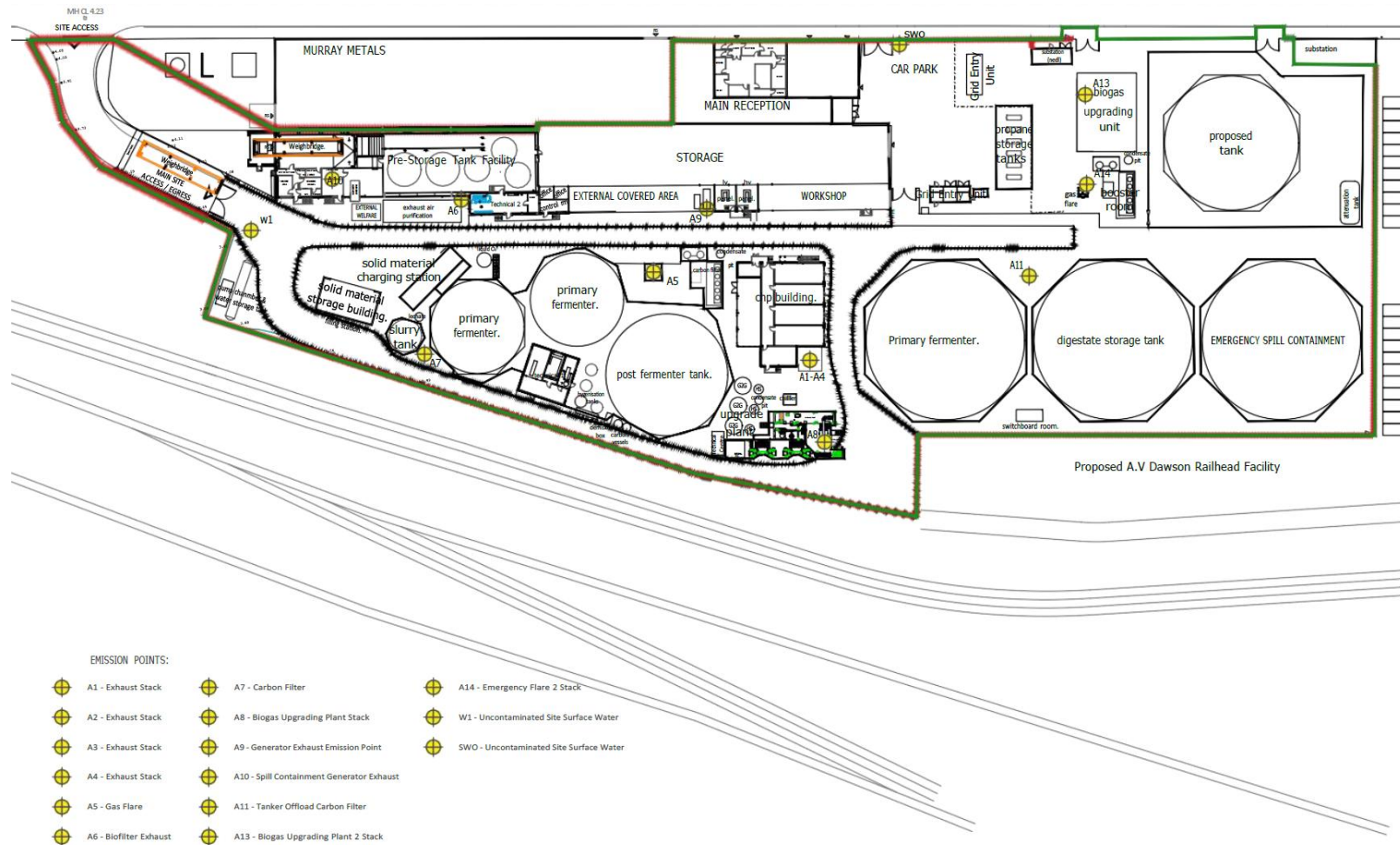
An external independent specialist contractor is contracted to carry out these surveys via optical gas imaging using hand-held optical imaging cameras to enable visualisation of gas leaks. The use of optical imaging is usually preferred at AD sites as much of the relevant equipment is located at height and can be more easily accessed with an optical imaging camera than via other surveying methods which require direct close access to parts of plant.

All areas of the site can be accessed during a 2–3-hour survey. The specialist company undertaking these surveys has extensive experience of carrying out such surveys at AD biogas sites and as a result of their activities on lots of different sites, have an awareness of the higher frequency areas where leaks are found.

A copy of the site plan detailing key items of site infrastructure is provided to the contractor prior to the survey as shown in Figure 1 below. A site plan showing key infrastructure is deemed sufficient information to inform the contractor given that the method used is optical imaging where all areas of the site can be viewed during the survey, rather than the use of a ‘sniffer’ that has to be specifically placed near to item by item tested areas. A list of specific potential source areas has been compiled based on sources identified in the site environmental and DSEAR risk assessments, fugitive emissions risk assessment, and wastewater and waste gas streams inventory. These source potential areas are listed in Figure 2 below.

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Figure 1 – Site Plan Provided to Inform LDAR Showing Key Infrastructure Items (see supporting documents for detailed view version)



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Figure 2 – VOC Leak Source Potential Key Areas and Equipment

Source Potential Item/Area	Site Plan Reference	Specific Source Items
Digesters 1 -5	Primary fermenters, secondary fermenter, and proposed tank.	PRV's, gas roof seal with tank, gas roofs/membranes, foam release valves, gas roof fan vents, submersible mixers and mixing points, digester viewing windows.
CHP's	A1-A4	CHP containers, inlet and outlet pipework and exhausts.
Flares	A5 and A14	Flare, connecting pipework and flanges.
Biogas Upgrading Units	A8 and A13	Seals vents, compressors and associated pipework
Grid Entry Unit	Associated with A8 and A13	Seals vents, compressors and associated pipework
Propane Storage Area	Propane storage tanks	Storage tank outer shells and connection points
Liquid Reception Tanks	Pre-storage tank facility	Tank seals, vent points and associated pipework
Odour Abatement Equipment	A6 and A7	Inlet pipework, outlet pipework and outer casing
Pasteurisers	Hygenisation tanks	Inlet pipework, casing, outlet pipework, vents.
Condensate collection system and gas line pipework		Collection sumps and pipework.
Gas line pipework, air injection points and gas analyser		Connection points, flanges, valves.

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The specialist contractor will carry out the site survey on the basis of the information above. If a leak is found during the survey, a video of the leak will be taken and provided to the operator as part of the end reporting data provided. The leak area will be tagged with a unique number and photographed to allow clear tracking of the leak point to completion of the repair.

Leaks will be quantified using quantification software fitted to the camera. Mean leak rate in ppm and g/hr will be reported for any leak found.

On successive visits to the site, the contractor will re-visit identified leak points from previous surveys and either verify that repairs works that have been undertaken have been successful through optical imaging or note that the leak has not yet been repaired and needs to remain on the tracking sheet of leaks still waiting to be repaired.

Copies of LDAR reports, imaging videos of leaks, and repair tracking sheets will be retained in the EMS records for the site as required by the site permit, and results of LDAR surveys reported to the Environment Agency in accordance with permit requirements.

Any leaks identified will be logged as an 'issue' in the site EMS and will remain open with documented ongoing comments and remarks until finally closed out following verification of repair success.