MOTT MACDONALD

Queensferry IED Permit Application

Accident Management Plan

June 2022

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Accident Management Plan

June 2022

Issue and Revision Record

Revision	Date	Originator	Checker	Approver	Description
A	15/06/2022	Olivia Ellson	Anita Manns	Dillon O'Brien	First Draft following Not Duly Made Notice

Document reference:

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Contents

1 Introduction

1.1 Overview

This Accident Management Plan (AMP) has been prepared by Mott MacDonald, for the Dŵr Cymru Welsh Water (DCWW) who are applying for a new bespoke environmental permit for the Queensferry Sludge Treatment Centre (STC) in line with the requirements of the Environmental Permitting Regulations 2016, as amended ('the EP Regulations') and NRW guidance 'How to Comply with your Environmental Permit' v8 Oct 2014. The AMP covers environmental accident management techniques, training information and emergency procedures.

1.2 EMS and the AMP

DCWW have an Environmental Management System (EMS) Policy. In line with the EMS Policy, the Queensferry STC will be operated in accordance with the DCWW Quality Management System (IMS).

DCWW have established and maintained documentation that defines and describes how the IMS is established, implemented, and maintained in accordance with ISO 9001:2008 and ISO/IEC 17025:2005 and monitoring emissions to air, land and water (MCERTS) Standards.

The system is structured on the organisation's strategic business areas, business processes and customer requirements.

DCWW has not established an ISO 14001:2004 for Queensferry WwTW, although the ISO 14001 guidelines are observed and followed at the Site and DCWW will extend the scope of accreditation to include it, where applicable.

The EMS is not integrated with the IMS at present. However, certain system procedures and operating procedures are shared by both systems.

Demonstrable procedures are outlined in the DCWW Environmental Policy dates April 2020 and the Site Operating Manual and IMS.

Scope of the Environmental Management System

The SP (1) 01 - Master Asset List contains all IMS sites and shows all certified Environmental (ISO 14001) sites.

Environmental Aspects and Impacts

EN (2) 01 - Environmental Aspects and Impacts Register

Consideration of environmental aspects covers, not only 'operational' activities, but also the auxiliary operations such as maintenance. Also included are abnormal situations such as shut down, start up, emergencies and special project trials.

The starting points for environmental aspects is the initial environmental review and this is a systematic examination of the company's activities to identify associated issues and includes:

- Operation or process activities – each operation is listed and evaluated as to the actual or potential impact that it has on the environment (positive or negative). Operations are broken into significant activities.
- Emissions and discharges – for each operations, process or activity, emissions/discharges are identified by the environmental media to which discharges occur, e.g. ambient air, controlled waters, or land.

- Pollutants – for each emission source, the pollutants of concern are identified.
- Use of raw materials – the use of all materials, including raw materials and types of energy fuel is examined, quantified, and classified as unavoidable, preferred, and avoidable use.
- Nuisance – all other effects, caused by the organisation's activities, such as noise, vibration, odour, steam, dust etc. are considered.

Each environmental aspect is carefully analysed to identify the actual affect it has, or may have, on the environment. While most impacts cause pollution directly or indirectly, it is recognised that some company activities may have effect on the environment. These are considered separately as a special case, as even small benefit may be significant and warrant attention.

The impacts for each environmental aspect are determined by reference to records of measurements, monitoring, surveys, reports, legislations, and codes of practice.

Environmental Procedures Overview

EN (3) 02 – Waste Management

This procedure defines waste management principles and guidance for the legal disposal of waste. This procedure goes into specific detail of the handling of Hazardous and Non-Hazardous Waste including the use of a Hazardous Internal Waste Transfer Form – ENF005 and the reporting of Fly Tipped Waste.

EN (3) 03 – Delivery Handling and Storage of Oils and Chemicals

This procedure defines in general terms the duties and responsibilities involved with the receipt and handling of chemicals, oils and fuels. This procedure goes into detail about the normal and abnormal operations of the delivery/receipt/handling of chemicals and oils and states the requirements of regulations around the storage of fuel and oil, both for fixed tanks and mobile bowsers.

EN (3) 04 – Environmental Incidents – Near Miss

This procedure defines the requirements necessary to deal with and report environmental incidents and must be used in conjunction with the DCWW Emergency Incident Response Handbook available from Senior Managers. This procedure gives examples of possible causes of incidents and explains the appropriate corrective and preventative actions to be taken.

EN (3) 05 – ISO AND EP Sites

This procedure applies to sites that hold ISO 14001 certification. However, the procedure itself will be extended to apply to all IED permitted sites, whether or not they are accredited under ISO 14001. It details what is included with a Site Initial Environmental Review and Local Site Environmental Management Plans, along with waste management, role responsibilities and information on the Annual Review – ENF 008.

An overall review of the IMS takes place every 12 months, and on other occasions as required, by Senior Management. There is a regular programme of audits covering all aspects of the IMS and EMS; they are included on the Internal Audit Programme operated by the Business Assurance team and audited by the Environment Agency (EA) on a frequent basis. In addition, the EMS and IMS are subject to audit by the inspection and certification company SGS (for accreditation purposes) every 6 months.

DCWW produces an annual report on environmental performance and where required attend local action group meetings.

One of the key tasks for DCWW during the permit determination process is the development of the management system arrangements for the STC Site to cover all STC operations as well as the quality and environmental aspects.

In 2020, DCWW updated their Asset Management Policy Statement, Environmental Policy Statement, Heath Safety and Wellbeing Policy Statement, Information Security Policy Statement, and Quality Policy Statement.

1.2.1 Accident Management Plan

The Site operates under a set of site-specific Emergency Procedures which is incorporated into DCWW's Environmental Management System (where applicable) to prevent and manage environmental related accidents. The Emergency Procedures includes an inventory of substances stored at the site, details on storage facilities, inventory of pollution prevention equipment (spill kits and fire extinguishers), inventory of waste and storage capacities, contact details of internal contacts, national and regional (where appropriate) contact details of emergency services and environmental regulators. The Emergency Procedures are distributed to key staff, to supervise the implementation of the Plan, and shared with external contacts (emergency services and the NRW). The Emergency Procedures are accompanied by a site plan that identifies the locations of designated storage areas (and their maximum storage capacity), location of spill kits and fire extinguisher and storage locations and hazards posed by chemical substances.

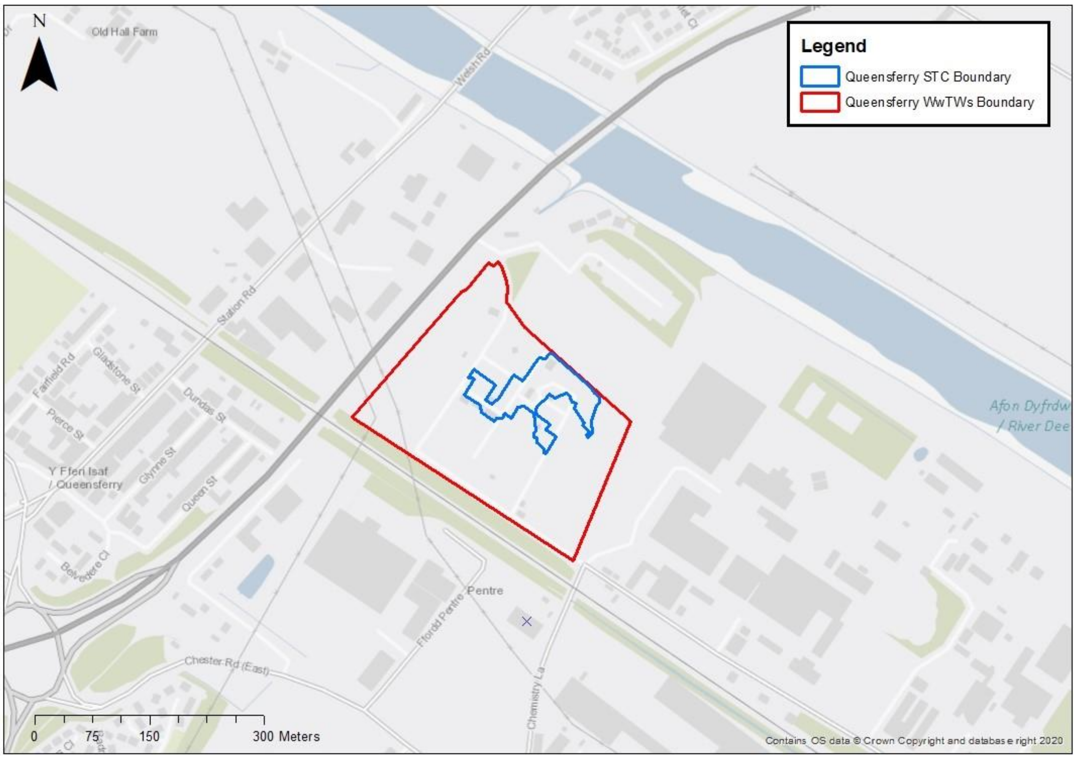
The Emergency Procedures reference procedures to comply with environmental legislation and protect the environment and human health in regard to potential accidents:

- Spill prevention and management, and operation of safety valves
- Procedure for recovering spilled product
- Procedures for the prevention of overfilling vessels, management of plant and equipment failures
- Fire prevention and responses to fires, including fire water containment procedures
- Security measures to prevent unauthorised access, arson and vandalism
- Competence, training and awareness requirements
- Monitoring and measurement requirements
- Record keeping procedures for the recording of incidents, accidents and near misses
- Emergency procedures to notify relevant authorities, emergency services and neighbours

1.3 Site Location

Figure 1.1: Queensferry STC Site Location

Queensferry STC is situated within the Queensferry Industrial Estate, adjacent to the River Dee, in Deeside. The location of the STC is shown in Figure 1.1The site includes two anaerobic digestors which are located towards the northeast of the site.


N
Legend
Queensferry STC Boundary
Queensferry WwTWs Boundary
Old Hall Farm
Welsh Rd
Station Rd
Fairfield Rd
Gladstone St
Dundas St
Pierce St
Glynne St
Y Fferi Isaf / Queensferry
Queen St
Belvedere Cl
Pentre
Ffordd Pentre
Chester Rd (East)
Chemistry La
Afon Dyfrdw / River Dee
0 75 150 300 Meters
Contains OS data © Crown Copyright and database right 2020

2 Process Description

2.1 Incoming Wastewater and Sludge

The Site receives flow from 6 pumping stations with approximately 80% of flows being classed as industrial effluent. It also receives domestic waste imports directly into the inlet works and a DCWW satellite site imports sludge via the sludge centre.

2.2 Wastewater Treatment

Preliminary treatment consists of two Escalator screens and associated de-waterer compactor, grit plant, and ferric dosing to assist with potential odour issues. Pass forward flow is 277.6 l/s. Any flow in excess of this is diverted to the two storm tanks via a fixed weir in the inlet channel. This is automatically returned to the inlet works once high incoming flows subside.

The inlet pumping station transfers crude sewage to two Primary Settlement Tanks (PSTs). Settled effluent weirs over the PSTs and is divided between three high-rate filters and five conventional biological filters (four with stone media and one with plastic media), in an approximate 70:30 split respectively. Biologically treated effluent passes to eight humus tanks for secondary settlement; two radial tanks receive flow from the hi-rate filters and six Dortmund style tanks receive flow from the traditional filters. Before flow reaches the final effluent outfall to the River Dee, it passes through an ultraviolet disinfection system to denature any remaining bacteria and viruses.

2.3 Sludge Treatment

Indigenous primary sludge (approximately 5.5TDS/Day) is transferred to two 243m^3 (each) covered concrete screened sludge blending tanks before being pumped to a drum thickener, which thickens the sludge to approximately 6% dry solids with the aid of a polymer. The sludge is then stored in a third 243m^3 covered concrete sludge storage tank, called the digester feed tank.

From here the sludge is transferred to two 1705m^3 (each) concrete digester tanks on a timed basis to undergo mesophilic anaerobic digestion. After a set retention time the digested sludge is then transferred and held in three 950m^3 (each) open topped concrete rectangular secondary digesters (former aeration lanes) for a further set time period. The treated sludge is then pumped to one 159m^3 open glass fused steel centrifuge feed tank and then de-watered via a single centrifuge with the aid of polymer to increase the percentage dry solids to between 20 and 25%. The de-watered sludge is then transferred and stored in three 70m^3 (each) open concrete cake pads ready for export to Five Fords for further treatment.

The biogas generated during digestion is stored in a one double membrane gas holder and is then used in a combined heat and power unit for electricity generation, which supplies the digestion plant and for recovering heat, to maintain digester temperature. The site has one biogas, one dual fuel and one oil boiler which provides hot water for the digestion process. Any excess biogas is flared off via the on-site waste bio-gas burner (flare stack).

Refer to B14411-123532-XX-XX-DR-AD-PR8401 - IED Queensferry - Block Flow Diagram for a schematic of the sludge treatment process and B14411-123532-XX-XX-DR-AC-PN8202 - IED Queensferry - Site Layout Plan (Emissions), for location of the sludge treatment assets.

The Queensferry IED permit will include the following assets:

- 1 No. Sludge reception tank (imported and screened sludge) (164m^3)

- 1 No. Sludge screen
- 2 No. Screened sludge blending tanks (243m^3 each)
- 1 No. Sludge thickener
- 1 No. Thickened sludge tank (digester feed tank) (243m^3)
- 2 No. Digesters (1705m^3 each)
- 1 No. Gas bag holder
- 1 No. CHP unit
- 3 No. Boilers
- 1 No. Biogas flare stack
- 2 No. Digested sludge holding tanks (468m^3 each)
- 5 No. Digested sludge storage tanks (1720m^3 & 1806m^3 (concrete) & 3 x 950m^3 (former aeration lanes))
- 1 No. Centrifuge feed tank (159m^3)
- 1 No. Centrifuge
- 3 No. Cake storage bays (70m^3 each)

The CHP engine at Queensferry has been in operation since August 2004, it is powered by biogas and has a thermal rated input of 0.545 MWth. Therefore, the Site falls outside the scope of the Medium Combustion Plant Directive (MCPD) since the thermal rated input is less. It is also, not subject to the specified generator rules as it is not used for standby/islanded operation. The CHP total annual operating hours is 8,500, allowing for routine maintenance.

There are three dual fuel boilers (gas oil/biogas) all running continuously. Each boiler has a thermal rated input of 0.39MWth. The operating hours are unknown. There is one standby 0.7MWth generator on the site that is powered by red diesel.

3 Accident Management Techniques

3.1 Loss of Containment

3.1.1 Gas Escape

Loss of containment of gaseous materials at the STC could result in the escape of biogas or other gases to the atmosphere around the site. In order to minimise the potential for accidental releases of gas from the Plant the following measures have been adopted:

- The Gas Holder is a double membrane consisting of an inner and outer membrane of double- sided PVC-lined fabric. The stored gas is contained within the inner membrane. The space between the inner and outer membranes is filled with air under pressure by duty/standby blowers, which run continuously. The exterior dimension of the gasholder remains constant.
- All pipework at the site used for the transfer of gaseous products has been manufactured to the appropriate British Standard using appropriate grade materials and all pipe joints and seals are also designed to meet the required British Standard;
- Regular monitoring of storage vessels, pipework and gas levels is undertaken to ensure no fugitive emissions are being released;
- Storage vessels and pipework are subject to regular visual inspection to ensure the structural integrity of the system remains uncompromised;
- All staff with responsibility for the handling or transfer of gaseous materials receive appropriate training for their role; and
- All staff on site receive training in site emergency procedures and the actions to take in the event of discovering a gas leak as part of their mandatory site induction training.
- The gas system has safety pressure release valves, which are designed to prevent over pressurisation of the system. Gas emissions from this point are monitored on telemetry with immediate call-out of staff to remedy.
- A waste gas burner is incorporated to deal with excess biogas and is the first point of relief for excess gas or pressure

In the event of a loss of containment of gaseous materials at the site the Emergency Gas Plan will be followed. Preventative measures incorporated into normal operations include a risk assessment in accordance with the Dangerous Substances and Explosive Atmosphere Regulations 2002 (DSEAR) that will be periodically reviewed and updated against the latest DSEAR regulations and guidance to ensure best practice is adopted at the Plant.

3.1.2 Liquid Escape

Failure of the liquid containment systems at the STC could potentially lead to reagents and effluents discharging to surface waters and ground waters in proximity to the site. Potential risks associated with this have been reduced through the implementation of the following measures:

- The storage vessels for all liquid materials for sludge treatment on-site are double skinned or bunded to 110% capacity and have been manufactured to the required British Standard using appropriate grade materials;
- All pipework at the site used for the transfer of liquids has been manufactured to the appropriate British Standard using appropriate grade materials and all pipe joints and seals are also designed to meet the required British Standard;

- Regular monitoring of storage vessels, pipework and fluid levels is undertaken to ensure no fugitive emissions are being released;
- Storage vessels, bunds and pipework are subject to regular inspection by site operational and maintenance teams to ensure the structural integrity of the system remains uncompromised;
- Spill kits comprising suitable materials for the containment of liquid spills have been placed appropriately throughout the site for the use of all staff;
- Site surfaces surrounding liquid storage areas and transfer pipes are constructed of impermeable material and equipped with appropriate drainage structures to prevent escape of fluids to surface waters or groundwaters;
- All staff with responsibility for the handling or transfer of liquid materials receive appropriate training for their role; and
- All staff on site must receive training in site emergency procedures and the actions to take in the event of discovering a liquid spillage and the use of spill containment measures as part of their mandatory site induction training.

3.1.3 Material Storage

All chemical tanks and stores must be clearly labelled and marked with appropriate warning signs and all delivery points must be kept locked except when in the presence of a Works team member.

The levels of raw materials are checked and recorded. Ferric sulphate levels are checked daily and recorded in WOF 002d (Daily Checklist of Routine Activities), and diesel level is checked monthly and recorded in WOF 002m (Monthly Checklist of Routine Activities).

During deliveries of material to site, special care is taken to ensure that all storage tank levels and contents are checked in order to prevent the accidental overfilling of tanks or the inadvertent mixing of substances. Specific measures are in place for the discharging of sludge from delivery tankers to reduce the risk of overfilling of the tank and spillages during discharge.

The following are requirements for deliveries on site:

- Each direct delivery must be checked for the correct quality and strength and to ensure that no damage etc. has occurred in transit.
- Supplier's Advice Notes must be checked, to ensure that the goods match the documentation, and then signed.
- Retained copies of Supplier's Advice Notes are filed in the Reception Building
- All chemical deliveries must be supervised by nominated personnel as detailed on the current list.
- Chemical deliveries must be recorded and must include a declaration that they conform to the required standard, either on the delivery note, or as a separate certificate of conformance
- Appropriate training is provided to personnel involved in receipt and handling of deliveries and specific procedures for the filling of tanks have been developed within the Plant management systems.

3.1.4 Odorous Emissions

Odour control systems are installed at Queensferry WwTW and operate in the following areas:

- Inlet Works (Ferric Sulphate Dosing)
- Inlet Works (extraction from inlet screen and grit discharge chute)
- Sludge Thickeners (extraction from building and consolidation tanks)

- Imported Sludge Works (extraction from Imported Sludge Tanks)
- Technical information regarding OCU operation is outlined in Document Reference: B14411-123532-ZZ-XX-PR-ZA-DH1039 - Odour Management Plan.

Regular inspection of site storage facilities and pipework is undertaken to ensure that the structural integrity of the system remains intact.

Regular site inspections and sniff checks are undertaken by the site team to ensure that no significant fugitive emissions of odour likely to cause pollution of the environment, adversely impact human health or significantly reduce the amenity of the local area are present. In the event of an accidental emission of odorous material from site storage facilities or pipework, the source of the emission will be isolated, investigated and, if required, operation suspended until the source of the emission has been sealed.

3.1.5 Vandalism and Unauthorised Access

Vandalism and unauthorised access to plant infrastructure and work areas has the potential to result in:

- Damage to plant infrastructure and equipment;
- Increased risk of injury to personnel; and
- Uncontrolled release of fugitive emissions of gaseous, liquid or solid materials to the environment.

Operations and Maintenance (O&M) activities at the STC occur on a continuous basis and high levels of site security are maintained to prevent unauthorised access to plant infrastructure and work areas. In light of this the potential for vandalism is considered to be effectively minimised. The following measures have also been adopted as security measures:

- An intruder alarm is activated/deactivated by keypad entry is operational in all major buildings covering:
  - the Control Building (Main Panel Room)
  - Boiler House & Control Room
  - Admin Office
  - Mess Room
- Fencing has been erected around the site boundary to prevent unauthorised access;
- Security gates have been installed at the site entrances;
- Lighting has been incorporated to provide increased visibility and deter intruders;
- Warning notices have placed at site access points;
- Regular inspections of the perimeter fencing are undertaken to identify areas of damage and maintenance is undertaken where required;
- Keys and access codes are issued to suitably inducted and authorised staff and contractors and all visitors must be registered prior to entering the site and must sign out upon leaving.
- CCTV installed across site to monitor process

3.1.6 Physical Protection Measures

The site has been designed to include protection of structures to minimise accident / incident issues. Potential risks associated with this have been reduced through the implementation of the following physical protection measures:

- All pipework at the site used for the transfer of gaseous products has been manufactured to the required British Standards using appropriate grade materials and all pipe joints and seals are also designed to meet the required British Standard; and
- Storage vessels and pipework are subject to regular inspection, by the site team to ensure the structural integrity of the system remains uncompromised.

3.2 Fire

Operational activities at the STC are such that the potential for fire and explosion exists. However, the local Fire Service has not carried out any risk assessment investigations on site. Potential hazards arising from fire and explosion at the Plant include:

- Uncontrolled release of pollutants from equipment, plant and infrastructure;
- Uncontrolled release of pollutants from material stores; and
- Loss of containment of contaminated firewater.

Fire extinguishers are placed throughout the STC, and operations staff are trained in their use for escape purposes only in order to minimise the risk to life posed by fire and explosion. However, the emergency policy is to evacuate the building in the event of a fire. Staff are informed during induction of the emergency procedures at the Plant to be followed in the event of fire incidents at the site. There is automatic gas escape and fire detection equipment installed which initiates a shutdown of processes if activated

3.3 Incident Response Review

Following the occurrence of any incident identified above, the incident will be logged within the company health and safety system and a review of the incident response and applicable emergency procedure will be undertaken. This review will assess:

- The cause of the incident;
- The effectiveness of the response measures;
- The effectiveness of the emergency response management team;
- Lessons learned;
- Recommendations for improvement.

If appropriate, the findings of this review process will be escalated and will inform immediate or future investment decisions and planning and revisions of the Accident Management Plan.

3.4 Tabular Accident Management Plan

Hazard	Likelihood	Consequences	Controls	Actions
Loss of containment – gas leakage	Low	Uncontrolled loss of pollutants from plant / infrastructure Loss from installation materials stores Adverse impact on human health Adverse impact on local ecology	Appropriate training Bunding of storage containers Sealed drainage & impermeable areas Pipework & fitting to appropriate British Standards Regular monitoring & inspection Spill kits available All chemical deliveries supervised and receipts kept.	*See appropriate emergency procedure)*

Hazard	Likelihood	Consequences	Controls	Actions
Loss of containment – liquid leakage	Low	Uncontrolled loss of pollutants from plant / infrastructure Loss from installation materials stores Adverse impact on human health Adverse impact on local ecology Loss of amenity in local area	See above section Auto-shut on some filling systems. Overflows to site return system	See emergency procedures COSHH assessments
Vandalism	Low	Uncontrolled loss of pollutants from plant / infrastructure Loss from installation materials stores Adverse impact on local ecology Loss of amenity in local area	Site boundary fence and security measures CCTV & site lighting Smartwater marking of some plant items	
Unauthorised access	Low	Uncontrolled loss of pollutants from plant / infrastructure	Signing in and out, and visitors must announce their arrival to a member of Operations personnel.	
Equipment / plant failure	Medium	Uncontrolled loss of pollutants from plant / infrastructure	24/7 telemetry 24/7 control room and access to standby personnel Regular proactive and reactive maintenance	Work instructions
Fire	Low	Uncontrolled loss of pollutants from plant / infrastructure Loss from installation materials stores Adverse impact on human health Adverse impact on local ecology Loss of amenity in local area Loss of containment of fire water	Appropriate training (fire awareness) Fire extinguishers available in area. Bunding of storage containers Sealed drainage & impermeable areas Pipework & fitting to appropriate British Standards Regular monitoring & inspection Spill kits available All chemical deliveries supervised All major plant is continually monitored on telemetry.	Work instructions

4 Competence and Training

Staff at the Installation have the competency to manage and operate activities without causing pollution. Competency is ensured through the appropriate training of all staff, covering:

- Awareness of the regulatory implications of the Environmental Permit and AMP for the activity and their work activities;
- Awareness of all potential environmental effects from operation under normal and abnormal circumstances;
- Awareness of the need to report any deviation from the Environmental Permit;
- Prevention of accidental emissions and action to be taken if accidental emissions occur.

All staff are aware of the implications of activities undertaken including the operation of the Site. Staff have clearly defined roles and responsibilities. Skills and competencies necessary for key posts are documented and records of training needs and training received for these posts maintained.

All DCWW Wastewater Treatment Works Operators are put through rigorous training to ensure competence for the role. Initially all operatives will complete a Level 2 Wastewater Treatment Processes Programme which is 9-days' duration. This consists of units from the Certification and Assessment Board for the Water Industry (CABWI) Diploma in Water Engineering with written assessments and covers all basic aspects of the wastewater process. Six to twelve months later, the Operators will complete the Level 3 Competent Operator Programme.

An "Advanced Digestion – Technical Operator" Knowledge and Skills Framework has been developed to identify all the relevant training required for the role. Through monthly one to ones with line managers and the annual Performance Management Review Process it is ensured that operations staff can demonstrate the knowledge and skills identified or are put forward for further training to develop the competency, if needed.

Training in the actions to be taken in the event of an accident or emergency is provided to all Operator and Contractor staff working on site as part of their mandatory site induction procedure. All staff are required to demonstrate their understanding of the AMP, and the actions and procedures contained therein, prior to undertaking any activities on-site. It is the responsibility of the site manager to ensure that all staff members have received this training.

Regular installation drills are undertaken to ensure that all staff are aware of the actions to be taken in the event of an accident or emergency and those staff with specific responsibilities are fully versed in their duties.

Copies of the AMP are available for the review of all staff.

DCWW is currently working on an accredited Competency Management System under the Competent Operator Scheme, and hopes to have this completed in the next 6 months. The Scheme will develop technical competency courses and skills to demonstrate that personnel have the appropriate technical skills and knowledge to manage the activities undertaken. This will be independently certificated and audited, through a third-party certification body (currently identified as SGS in September 2022) to ensure it meets the requirements of the Version 5 Competence Management System Standard, developed by Energy & Utility Skills. The Competence Management System (CMS) will enable Operators to demonstrate technically competent management on the basis of corporate competence and employees' individual competence. Individual competence remains a key component with each employee having the relevant technical competences required to carry out their role. It is expected that DCWW will gain an accredited CMS by end of October 2022 for all four of its currently permitted sites and two site applying for environmental permits, including Queensferry.

5 Distribution and Revisions

Master copies of the AMP are made available to all staff as part of their induction package and available on Sharepoint (DCWW Document system) for staff to review.

Review of the AMP will be undertaken following any accident or emergency or after a period of not more than every three years; whichever is the sooner. It is the responsibility of the site manager to ensure that this review is carried out. Should a need for earlier review be identified, e.g. following an incident, a change in working practices or equipment at the Installation, this shall be undertaken by the Installation EMS Manager.

6 Health and Safety

DCWW has a comprehensive H&S management system. This includes numerous instruction and guidance procedures. All staff are trained in elements of H&S appropriate to their role.

All operations within the works are subject to the provisions of the Dwr Cymru/Welsh Water Health and Safety Manual.

Safety equipment such as breathing apparatus, gas bottles, and harnesses is located at the Chester WwTW. Personal gas detectors are carried on Company vehicles.

The training records are held electronically within the SAP HR module and are administered by the Training Dept.

7 Non- Compliance Procedures

Routine operation of the installation is subject to the conditions of the site permit which details various requirements for actions and reporting for both routine and non-compliance.

The permit sections include:

Section 1 - Management of Installation

General management of the site, including handling and disposal of wastes

Section 2 Operation of Installation

General operation of permitted activities and improvements

Section 3 Emissions and Monitoring

Routine monitoring of all emissions (e.g. odour), including annual reporting of specified point emissions (e.g. various specified exhaust gases from CHPs)

Section 4 Records and Reporting

An important section that includes the reporting of non-compliance with any permitted element. The major elements of concern would be

1. Loss of containment of gaseous substance
2. Loss of containment of liquid substance
3. Equipment / plant failure causing loss of gas or liquid – inclusive of routine emissions monitoring.

Any losses or failures to comply with these areas require immediate notification to the Environment Agency, followed by “Schedule 6, Part A Notification” by email or paper means. The Part A must be submitted within 24hrs of detection of failure. “Part B” notification would then follow giving supporting information as soon as practicable.

Handling of the incidents on site will be in line with relevant internal incident and accident procedures. These are all subject to audit via internal and external audit protocols.

8 Appendices

A. Emergency procedures

Environmental Management – General Overview

EN (3) 01 - Level 3 Procedure

1.0 Purpose and Scope

This Procedure defines in broad terms the principles of environmental management on operational sites, offices and business areas included in the scope of the DCWW Environmental Management System. This Procedure provides guidance with regard to identification of site specific environmental impacts and the development of emergency procedures and waste management plans.

This Procedure applies to all operational sites, offices and business areas within DCWW.

2.0 Contents

3.0 Record of Change

Issue Number & Date	Details of Change
Issue 07, 28th May 2015	The procedure has been fully rewritten, the sections for 'Site Environmental Management System – IMS Team', 'Site Environmental Management System – Ops Coordinator' and 'Site Annual Environmental Review' have been removed and added to the new EN(3) 05 – EMS Site Only procedure. Section 5 of this procedure has been changed to become an overview of the other Environmental Procedures.
Issue 08, 10th April 2018	Deletion of reference to the environmental management program in section 4.2 Section 6 – Addition of references and records
Issue 09, 11th October 2019	Section 4.1. updated to remove reference to SP (2) 06 – Environmental Aspects and Impact. Procedure removed as EN(2) 01 updated to provide full guidance. Section 4.2 has been renamed to Environmental Performance Commitments.

Issue Number & Date	Details of Change
Issue 10, 18th January 2021	Annual review of procedure All amendments highlighted in yellow. Section 4.1 - Updated to reference the new environmental aspect and impacts register and process. Section 4.2 – Updated to reference the PR19 – Performance Commitments. Section 5 – Reworded to reflect the process.
Issue 11, 22 October 2021	Section 5 – removed ENF 006 Form and replace with the requirement to email information to the DCWW Permitting Inbox for Fly Tipping.

4.0 Generic Environmental Management System – IMS Team

All aspects of the generic environmental management system are controlled and maintained by the IMS team.

4.1 Aspect and Impact Register

To understand DCWW's environmental impacts EN (2) 01 - Aspect and Impact Register has been developed and is maintained for our activities. The Register details all aspects of our activities and their potential impact on the environment, providing guidance, detailing how the aspects and impacts have been identified, scored and controlled.

Once the Aspects have been identified they are graded using the Significant Environmental Aspects Risk Rating Matrix. The matrix applies a simple traffic light system, Red signifying those aspects that have a greater impact on the environment, reducing severity to Amber then Green. Aspects and Impacts graded Red and Amber are considered significant and targets will be set to track, monitor and improve performance. These are held centrally in our PR19 – Performance Commitments.

Performance commitments are reported monthly to DCE to monitor progress.

4.2 Environmental Performance Commitments

IMS (1) 02 DCWW Performance Commitments is derived from the PR19 – Performance Commitments and address significant aspects and impacts. The performance commitments set targets to reduce impacts on the environment. These are monitored and controlled by business areas and reviewed by the IMS Team during Management Reviews.

4.3 Scope of the Environmental Management System

The SP (1) 01 - Master Asset List contains all IMS sites and shows all certified Environmental (ISO 14001) sites.

5.0 Environmental Procedures Overview

EN (3) 02 – Waste Management

This procedure defines waste management principles and guidance for the legal disposal of waste. This procedure goes into specific detail of the handling of Hazardous and Non-Hazardous Waste including the use of a Hazardous Internal Waste Transfer Form – ENF005 and the reporting of Fly Tipped Waste.

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This procedure defines in general terms the duties and responsibilities involved with the receipt and handling of chemicals, oils and fuels. This procedure goes into detail about the normal and abnormal operations of the delivery/receipt/handling of chemicals and oils and states the requirements of regulations around the storage of fuel and oil, both for fixed tanks and mobile bowsers.

EN (3) 04 – Environmental Incidents – Near Miss
This procedure defines the requirements necessary to deal with and report environmental incidents and must be used in conjunction with the DCWW Emergency Incident Response Handbook available from Senior Managers. This procedure gives examples of possible causes of incidents and explains the appropriate corrective and preventative actions to be taken.

EN (3) 05 – EMS Sites Only
This procedure applies to sites that hold ISO 14001 certification. It details what is included with a Site Initial Environmental Review and Local Site Environmental Management Plans, along with waste management, role responsibilities and information on the Annual Review – ENF 008.

6.0 Records

6.1 Records

Record	Reference	Retained by	Retention Period
Hazardous Waste Internal Transfer Note	ENF 005	EMS File at location / Intranet	3 years
Annual Review	ENF 008	EMS File at location / Intranet	3 years

6.2 References

	Reference	Document Ref
1	Aspects and Impacts Register	EN (2) 01
2	Waste Management	EN (3) 02
3	Delivery Handling and Storage of Oils and Chemicals	EN (3) 03
4	Environmental Incidents – Near Miss	EN (3) 04
5	EMS Sites Only	EN (3) 05
6	Master Asset List	SP (1) 01
7	Performance Commitments	IMS (1) 02

1.0 Purpose and Scope

This procedure defines waste management principles used within the organisation and provides guidance on legal requirements for the disposal of waste.

This procedure applies to all sites, offices and business areas within DCWW.

2.0 Contents

3.0 Record of Change

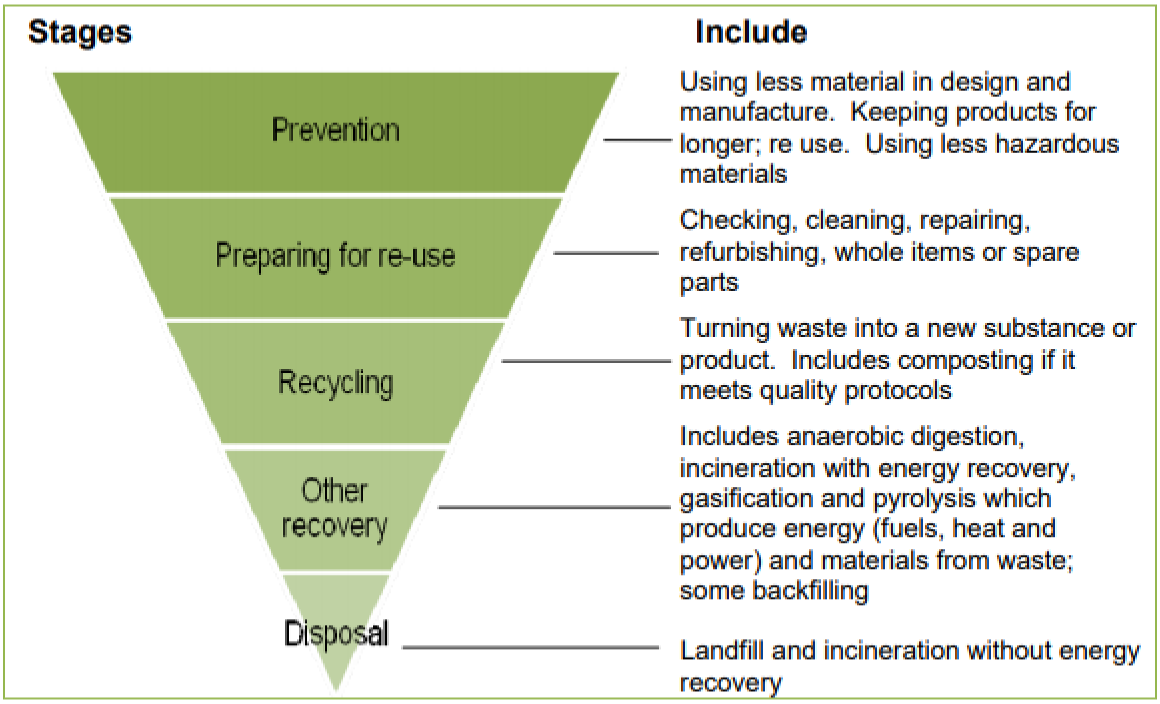
Issue Number & Date	Details of Change
04, 14th March 2016	Section 4.1 & 4.2 amended so that non-hazardous waste doesn't have to be locked and covered but hazardous waste does. Section 4.2 now includes a link to the list of Hazardous Waste Sites. Section 6.2 is new.
05, 10th April 2017	Section 4.2 amended to state that only sites in wales need to apply for a waste hazardous producer code. Section 6.2 enhanced with further references.
06, 12th October 2018	Procedure Reviewed. Minor administrative amends included hyperlink updates.
07, 18 January 2021	Annual Review of procedure Section 5 – Link to NRW useful information removed as website has been removed

Issue Number & Date	Details of Change
08, 22 October 2021	Section 5 – Remove ENF 006 and replace with the requirement to report to the DCWW Permitting Inbox.

4.0 Waste Management

Waste management includes the storage, collection, transportation, and disposal of waste. DCWW must apply duty of care to all waste generated by our activities and has responsibility for waste until its final disposal.

Each site must manage its waste streams in accordance with legal requirements, which involves identification of opportunities to reduce the quantity of waste, identification of waste types, waste segregation and correct disposal. Each site must apply the waste hierarchy as follows;



The main classifications of waste include:

1. Non-hazardous waste e.g. mess room waste
2. Hazardous Wastes – e.g. waste oil
3. Waste Electrical and Electronic Equipment (WEEE)

4.1 Non - Hazardous Waste

To ensure good management of waste produced on site, it is important to maintain good housekeeping. Wastes must be:

1. Segregated according to their classification. For example do not mix mess room waste with grit and screening.
2. Labelled.
3. Placed within the correct storage containers.
4. Located in an area that is secure (from vandalism).
5. Removed from site using approved waste carriers and waste transfer notes must be retained for 2 years.

In order to minimise pollution all waste skips must be stored on an impervious surface (e.g. hardstand).

Examples of non-hazardous waste includes:

- General Waste – Plastic/Paper/Cardboard
- Metal/Wood
- Screenings & Grit

4.2 Hazardous Waste

Hazardous waste is dangerous or potentially harmful to our health and/or the environment. Hazardous waste can be liquids, solids, gases and could be cleaning fluids, pesticides or the by-products of manufacturing processes. Contaminated materials must be disposed of using an approved waste contractor.

The Hazardous Waste Regulations defines hazardous waste as waste that appears on a list drawn up by the European Commission known as the European Waste Catalogue (EWC).

DCWW has registered the main sites as producers of hazardous waste (deemed to produce more than 500kg of hazardous waste per year). These are found by checking the list of Hazardous Waste Sites, or in the NRW public register **here**. Please note this is only for sites in Wales, this is not a requirement for sites in England, regulated by the EA. Alternatively, you can contact the IMS.Team@dwrcymru.com.

Hazardous Waste must be:

1. Individually segregated i.e. WEEE must only be stored with WEEE.
2. All hazardous waste containers must be labelled.
3. Small quantities of hazardous waste may be transported to named sites for disposal. These movements must be covered by the DCWW Internal Hazardous Waste Form – ENF 005.
4. If hazardous waste is in liquid form, the total quantity stored must not exceed 23,000 litres.
5. Hazardous waste must not be stored on site for a period longer than 12 months.
6. All hazardous waste must be stored in a secure area and skips must be covered and lockable.
7. All hazardous waste must be removed from site using licenced hazardous waste carriers and the transfer notes must be retained for 3 years.

In order to minimise pollution all waste skips must be stored on an impervious surface (e.g. hardstand).

Examples of Hazardous Waste include:

- WEEE (Electrical Waste)
- Fluorescent Tubes
- Batteries
- Oil contaminated items such as oily rags
- Waste Oils

4.3 Removal of Waste from Site

To comply with The Controlled Waste Regulations, Hazardous Waste Regulations and the Waste Regulations (England and Wales), sites producing waste must:

1. Ensure that all waste carriers used are DCWW approved contractors which are procured through SRM.

2. Ensure that Waste carriers are EA/NRW licensed carriers (licences are available from the **EA website, NRW Website** and **internal Waste Carrier List**).

3. Ensure that the site to which the waste is being transferred is permitted to accept the waste being transferred.

4. Duty of care records must be kept for all wastes leaving site. A Controlled Waste Transfer or Consignment Note must accompany each lift of waste. However, if the same non-hazardous waste is to be transferred from same site to the same disposal site by the same carrier, a single note can be used to cover all loads over a period not exceeding 12 months. The note must detail the amount, the type of waste, the origin, the disposal site, the carrier, registration, EU waste code, date of transfer, SIC Code, the signature of 2 parties and a declaration that the hierarchy of waste (see section **Error! Reference source not found.**) has been applied.

5. Keep all records for the prescribed period amount of time:

    - Hazardous Waste = 3 years
    - Non-Hazardous Waste = 2 years

    Note: Records must be available for inspection and kept in an orderly manner.

4.4 Waste Transfer Notes

It is the responsibility of DCWW to retain the correctly filled out waste transfer notes. Once these are signed for they are legally binding documents. For waste removed from sites, the Waste Transfer Notes must display:

- The correct Standard Industry Code (SIC code)
- *Potable Operational Sites =* ***36.00***
- *Wastewater Operational Sites =* ***37.00***
- The waste management hierarchy statement
- The Waste Carriers License Code of the waste carrier
- The collection and disposal address' (this for traceability)

If the waste removed from site is Hazardous, the Waste Transfer Notes must also display:

- The Hazardous Waste Producer Code for the DCWW site (if applicable)
- The European Waste Catalogue (EWC) Code of the waste removed.

Please see the Waste Transfer Note Briefing Document for information on what a Waste Transfer Note is, why they are required and an example of a correctly filled out Waste Transfer Note.

5.0 Fly-Tipped Waste

Fly tipping is the "the illegal deposit of any waste onto land i.e. waste dumped or tipped on a site with no licence to accept waste. It includes general household waste, larger domestic items, garden refuse and commercial waste e.g. rubble, clinical waste and tyres. There is an increased amount of "liquid wastes" and "hazardous waste" fly-tipped as a result of changes to the Landfill Regulations restricting these types of wastes from most landfills. There are several pieces of legislation relating to fly-tipping including the Clean Neighbourhoods and Environment Act 2005 and the Environment Protection Act (EPA) 1990, ss.33, 34 and 59.

It is the occupier's responsibility to deal with the fly tipped waste unless its originator can be traced. The following activities are considered best practice to deter fly tippers:

1. Do not allow non-business waste to be disposed of at site – this is also fly tipping.
2. Keep the areas surrounding the edge of the site clear
3. Where possible, keep site gates closed to prevent access to fly tippers.
4. Take pictures and record details of any fly tipped waste.
5. Arrange removal quickly to discourage further tipping.
6. Report any instances of fly tipping to the DCWW Permitting Inbox. Please include the location, details of Fly Tipping and photos if possible.

IMPORTANT SAFETY NOTE: Consider safety first – ensure you are not putting yourself or others at risk in handling any waste found. **Do not** open packages/containers. **Do not** move the waste if you suspect hazardous materials could be present – seek advice from the agencies below or report to your Line Manager as appropriate.

Waste may be removed by the local authority or removed by a registered waste carrier and disposed of. DCWW is a registered waste carrier and if it is safe to do so, it is permissible to transport controlled, non-hazardous waste direct to a licensed site for disposal. Written agreement should be obtained from the appropriate authorities prior to any removal – since the waste is "evidence".

Prosecution can only be brought by the local authority, the Environment Agency or the police. The relevant authority should be encouraged to prosecute as a successful prosecution means costs can be recovered by the landowner, or occupier, from the person(s) who deposited the waste, and discourages further fly tipping.

Waste resulting from fly tipping must be disposed of as described in section 5.0 of this procedure.

6.0 Records

6.1 Records

Record	Reference	Retained by	Retention Period
Hazardous Waste Internal Transfer Note	ENF 005	EMS File at location	3 years

6.2 References

	Reference	Document Ref
1.	European Waste Catalogue	EWC
2.	Environment Agency Public Register	EA Website
3.	Waste Transfer Note Briefing Document	WTN Briefing Document
4.	Hazardous Waste Sites	Hazardous Waste Sites
5	NRW Public Register	NRW Website

All records are retained as per document control and retention procedures.

1.0 Purpose and Scope

This procedure defines in general terms the duties and responsibilities involved with the receipt and handling of chemicals, oils and fuels.

Most chemicals and oils are classified under a European Agreement (ADR) as 'Dangerous Goods'. The UK Regulations giving force to this Agreement are concerned with regulating the transport of Dangerous Goods. 'Transport' also includes the delivery and unloading part of the transport chain. The DCWW 'Carriage of Dangerous Goods - Policy, Guidance and Procedure HSP701' provides further guidance. There are requirements in the regulations that staff handling dangerous goods receive training appropriate to their duties and responsibilities.

Potable Operations must read this procedure in conjunction with PO (3) 09 Chemical Deliveries.

This procedure applies to all sites and offices that are within DCWW.

2.0 Contents

3.0 Record of Change

Issue Number & Date	Details of Change
04, 28th May 2015	Section 4.2 – Secondary Containment Systems & Section 5.4 – Spill Kits are new sections on this procedure.

Issue Number & Date	Details of Change
05, 14th March 2016	Section 4.2 – amended to state that integrity checks on permanent bunds and necessary and alarms to be tested every 12 months. Section 6.1 & 6.2, extra records & references added.
06, 11th October 2019	Section 1 updated. Potable Operations must read EN (3) 03 Delivery Handling and Storage of Oils in conjunction with PO (3) 09 Chemical Deliveries and Testing.
07, 18 January 2021	Section 1.0 – Reference to ADR and Health and Safety HSP 701 Section 5.0 – Amendment to regulations, removal of reference to EA Section 5.4 – Amendments to the Spill kit requirements. Section 7.0 – Amendment to References
08, 17 January 2022	Annual review – updated hyperlinks

4.0 Receipt, Storage and Handling of Chemicals and Oils

4.1 Delivery/Receipt/Handling – Normal Operation

All chemicals used must be obtained from approved (generally framework) suppliers. Chemicals stored on Operational sites are recorded locally. All bulk chemical, oil and fuel deliveries must be supervised by persons who have been trained and are 'authorised'. Only employees have access to keys to open locks for chemical delivery points – keys are not issued to contractors and must not be given to delivery personnel. All bulk chemical delivery points must be clearly labelled and secured by a lock, or locking arrangements equivalent to specified standard. All chemicals and oils must be stored in such a way that will not give raise to a pollution incident should a container leak (e.g. bund/spill tray).

1. Before formally accepting delivery, the Authorised Person must:

   a) Ascertain that the correct goods are unloaded by comparing the relevant information on the transport document (delivery note) with the information on the package, container, tank, or vehicle.
   b) Carry out a visual inspection to check that packages are free from damage and are correctly labelled to correspond with the details on the transport document.

2. When deliveries are made to sites, details of the correct type and grade of chemical are located in the Works Operating Manual or Site Handbook.
3. The Authorised Person ensures that the delivery is placed in the designated storage area.
4. When bulk chemicals are delivered, the Authorised Person ensures that sufficient capacity to accept the delivery volume is available in the receiving tank.
5. Immediately following the unloading of the tank, vehicle or container, delivery points, valves, inspection points and storage areas shall be made secure.

4.2 Secondary Containment Systems

- For Potable, Chemical, oils, fuel stores, tanks, bunds and associated pipe work must be visually inspected weekly. For Waste, these must be inspected monthly and kept clear of rainwater and debris. This inspection may be undertaken weekly at high risk sites, this will be defined locally.

- Details of inspections carried out at Operational Sites are recorded either on Local Bund Inspection Forms or on AGA2.
- Any defects identified are reported to the Process Specialist / Production Manager / Operations Supervisor and recorded in the Works Diary.
- Integrity checks are necessary on permanent bunds. This will be achieved through the installation of bund alarms to ensure any leaks are identified.
- Bund alarms must be dynamically tested every 12 months and the results recorded.
- Any spillages into bunded areas must be removed immediately and disposed of in compliance with procedure Waste Management EN (3) 02.
- Any chemical storage tank taken out of service for refurbishment/renewal must be tested for 24 hours with water prior to being filled with chemical/ oil/ fuel.

Potable Requirements: If any standing water (typically rainwater for outside bunds) is found in the bund before emptying this must be tested for a number of parameters. Only if these are found to be within the parameters stated below can the bund be emptied to the environment;

- pH must be between 6 and 9
- Chlorine must be less than 0.05mg/l
- No unusual odour present
- No unusual colour present.

The emptying of bunds on a potable site must be recorded in the POF 007 together with the parameters mentioned above. If the parameters above are not met then the contents must be disposed of using an approved waste contractor following procedure Waste Management EN (3) 02.

If outside bunds do not fill with rainwater (especially after heavy rainfall) then these must be inspected as it is likely they will be leaking. If found to be leaking complete an ENF 007 – Environmental near miss form on the Assure Portal and a risk raised within Investment Manager System to resolve.

4.3 Delivery/Receipt/Handling – Abnormal Operation

Where chemicals delivered are outside of their specification (e.g. the delivery note does not match the order specification), the delivery must be refused. The First Line Manager is informed and the procurement department is informed. In the event of a spillage, site-specific emergency procedures must be followed if these are available and robust.

4.4 Incident Reporting

Any incident taking place involving the handling, unloading or storage of chemicals must be reported as soon as practicable using the company incident reporting form on Assure.

5.0 Oil and Fuel Storage

In Wales, The Water Resources (Control of Pollution) (Oil Storage) (Wales) Regulations 2016 apply. The Regulations require anyone who stores more than 200 litres of oil in Wales to provide more secure containment facilities for tanks, drums, Intermediate Bulk Containers (IBCs) and mobile bowsers, to prevent oil escaping into the environment. In England, The Control of Pollution (Oil Storage) (England) Regulations 2001 apply, however there are some differences in requirements.

Oils of any kind are included in these regulations: petrol, mineral oil, heating oil, lubricating oil, vegetable oil, paraffin and kerosene. Waste oil is exempt and is covered by the Hazardous Waste Regulations.

Oil stored in a container situated within a building or wholly underground, is also exempt from these regulations, however necessary precautions to prevent pollution/contamination to the environment should still be applied.

5.1 General Requirements of the Regulations

1. Has a capacity of not less than 110% of the containers capacity. If there is more than one container within the system, not less than 110% of the largest containers storage capacity or 25% aggregate storage capacity, whichever the greater.
2. If a drip tray is used as secondary containment system for drums, the drip tray must be able to hold 25% of the total volume of the drums.
3. Be located (or other steps must be taken) to minimise any risk of damage by impact (e.g. traffic).
4. Its base and walls must be impermeable to water and oil must not be penetrated by any valve, pipe or other opening which is used for draining the system.
5. If any fill or draw off pipe penetrates its base or any of its walls, the junction of the pipe with the base or walls must be suitably sealed to prevent oil escaping from the system.
6. Any valve, filter, sight gauge, vent pipe or other equipment ancillary to the container (other than a fill pipe or draw off pipe or, if the oil has a flashpoint of <32°C, a pump) must be kept within the secondary containment system.
7. Where a fill pipe is not within the secondary containment system, a drip tray must be used to catch any oil spilled when the container is being filled with oil.

5.2 Fixed Tanks

For fixed tanks, the following shall apply:

1. Sight gauges must be properly supported and fitted with a valve that must be closed when not in use.
2. Fill pipes, draw off pipes or overflow pipes must be located (or other measures must be taken) to minimise any risk of damage by impact, as far as is reasonably practicable. If above ground, pipes must be supported.
3. The tank must be fitted with an automatic overfill prevention device if the filling operation is controlled from a place where the tank and any vent pipe are not observable.
4. Any screw fitting or other fixed coupling that is fitted and is in sound condition must be used when the tank is being filled with oil.

Where oil from the tank is delivered through a permanently attached flexible pipe:

1. The pipe must be fitted with a tap or valve at the delivery end which closes automatically when not in use
2. The tap or valve must not be capable of being fixed in the open position unless the pipe is fitted with an automatic shut off device
3. The pipe must a) have a lockable valve where it leaves the container which is locked shut when not in use; and b) be kept within the secondary containment system when not in use.

Pumps must be:

1. Fitted with a non-return valve in its feed line.
2. Positioned to minimise any risk of damage by impact.
3. Protected from unauthorised use.

Permanent vent pipes, taps or valves through which oil can be discharged must be:

1. Within the secondary containment system.
2. Arranged to discharge the oil vertically downwards and be contained within the system.
3. In the case of a tap or valve, it must be fitted with a lock and locked shut when not in use.

5.3 Mobile Bowsers

1. Taps or valves permanently fixed to the unit through which oil can be discharged to the open must be fitted with a lock and locked shut when not in use.

2. Where oil is delivered through a flexible pipe which is permanently attached to the unit; a) the pipe must be fitted with a manually operated pump or with a valve at the delivery end which closes automatically when not in use and b) the pump or valve must be provided with a lock and locked shut when not in use, the pipe must be fitted with a lockable valve at the end where it leaves the container and must be locked shut when not in use.

5.4 Spill Kits

- Spill kits must be available on site and near where bulk chemicals/oil/diesel is stored.
- Spill kits must be stored indoors or protected if stored outside and the condition of the kit checked monthly as per SAP Work Manager Task list.
- In the event of a partially used and/or damaged spill kit a replacement must be ordered (where appropriate).
- **For potable sites -** a minimum of 2 x 60 litre capacity chemical spill kits and 2 x 60 litre capacity oil spill kits must be kept at all sites with bulk storage.
- **For waste sites -** spill kits will be deemed necessary following assessment of question 25 of the Workplace Inspection Form (WP02). A minimum of 1 x 60 litre capacity chemical spill kit must be stored for sites with bulk storage of chemicals and 1 x 60 litre oil spill kit must be stored for bulk storage of diesel/oil if deemed necessary.
- All operational staff must be made aware of and familiar with the site emergency procedures. If applicable, all site staff must be aware of the spill information sheet for the use and disposal of emergency spill equipment which shall be placed alongside spill kits.

In the event of an incident, initial action should be to:

- Assess the situation for any health and safety risk. If deemed unsafe contact your unit manager for further instruction
- Consult the site emergency procedures and, if it is safe to do so, identify and take measures to address the source of contamination/spill/leak
- Consult the COSHH data sheets and contain the area/spill
- Inform relevant managers and external parties
- If the incident is large scale, contact the Unit Manager and authorised waste contractors to assess and deal with the incident.

All actions must be in line with health and safety guidance so that individuals are not exposed to undue risk.

The secondary impacts of spills should be contained by ensuring that:

- PPE, equipment and tools should be disposed of or decontaminated.
- All contaminated materials such as absorbents, rags should be securely stored and disposed of appropriately. Any waste resulting from an incident must be disposed of as per EN (3) 02.

All paperwork resulting from the incident must be completed and retained on site ENF 005, Waste Transfer Notes and H&S Assure (if necessary)

6.0 Records

Record	Reference	Retained by	Retention Period
Delivery Note		Site/Catchment Office	3 Years
Works Diary	WOF 007/POF 007	Site	3 Years
Hazardous Waste Internal Transfer Note	ENF 005	EMS File at location/Intranet Local Documents	3 Years
Workplace Inspection	WP02	File at location/Intranet Local Documents	3 Years

7.0 Reference Documents

Document	Document Reference
Waste Management	EN (3) 02
Spill Information Sheet.	Spill information sheet
H&S Workplace Inspection Form	WP02
PO (3) 09 Chemical Deliveries	PO (3) 09
Carriage of Dangerous Goods	(ADR)
The Water Resources (Control of Pollution) (Oil Storage) (Wales) Regulations 2016	
The Control of Pollution (Oil Storage) (England) Regulations 2001	

Environmental Near Miss

EN (3) 04 – Level 3 Procedure

Owner – Paul Marsh

1.0 Purpose and Scope

This procedure defines the requirements necessary to deal with and report Environmental Near Misses for operational activities. For an incident considered a 'Silver' or 'Gold' or 'Major' according to DCWW's Emergency Planning refer to the DCWW Incident Response Manual.

This procedure applies to all operational activities; on operational and non-operational sites both on and off Dwr Cymru's land ownership.

2.0 Contents

3.0 Record of Change

Issue Number & Date	Details of Change
Issue 04, 13th January 2014	Minor updates include reference to the NRW and the inclusion of the Near Miss Reporting phone line for environmental near misses
Issue 05, 28th May 2015	This procedure has been rewritten to incorporate the recording of Environmental Incidents for the Capital Partners.
Issue 06, 14th March 2016	All references to Capital Partners have been removed. Following collaborative working with the Environment Team the procedure has been revised to improve incident/near miss reporting for biodiversity issues as well as operational issues. Section 4.0, 7.0, 9.2 & 10.0 are totally re-written or new and some additions have been added to section 1.0, & 6.0.
Issue 07, 10th April 2017	Section 5 – Amended to identify only sites with the ISO 14001 scope need emergency procedures. Reference to infozone changed to intranet throughout the document.

Issue Number & Date	Details of Change
Issue 08, 3rd January 2018	Section 7 – Amended to include WATPOL reference. Reference to infozone changed to intranet throughout the document.
Issue 09, 18th January 2021	Annual Review of Procedure. Changes highlighted in Yellow.
Issue 11, 17 January 2022	This procedure has been rewritten to provide guidance for reporting of Environmental Near Misses only. Any reference to Environmental Emergency Incidents requiring emergency or non emergency response has been removed.

4.0 Definitions and Guidance

A near miss as defined by HSP 802 – Incident Reporting Investigation procedure is 'an unplanned event which did not result in injury, illness or property damage but had the potential to do so'. Environmental examples of these would be a spillage of oil from a damaged hose that was dealt appropriately using spill kits in accordance with EN (3) 03 - Delivery, Handling and Storage of Oils and Chemicals procedure, or discovery of a protected species (e.g. great crested newts or bats). The routine maintenance of operations can either discover or disturb biodiversity which is defined as the variety of plant and animal life in the world or in particular habitats, e.g. a grass verge within an operational site, or a retention pond.

5.0 Local Environmental Emergency Procedures

Each operational site within the ISO 14001 environmental scope will have a set of specific emergency procedures on site and in the Local IMS folders on Source to cover Environmental Emergency Incidents. These ensure there will be an appropriate response to unexpected or accidental incidents. Procedures are established, implemented and maintained to:

- Identify potential accidents and emergency situations.
- Respond to accidents and emergency situations.
- Prevent or mitigate the environmental impacts that may be associated with them.
- Procedures will be reviewed, particularly after occurrence of an incident.

Emergency procedures on operational sites within ISO 14001 scope are periodically dynamically tested. Tests are recorded on ENF 003 – Testing Emergency Procedures and held on site or in the site Local Documents area on the Intranet.

6.0 Reporting of Environment Near Miss Guidance

Environmental Near Misses must be reported via the Assure Portal by selecting and completing the 'Environmental Near Miss Form (ENF 007).' Any remedial action that can't be addressed immediately will be addressed by the Site Supervisor through Assure. If there is any impact on the watercourse then a WATPOL (NOF 030) must also be completed.

All outstanding 'Environmental Near Misses' will be monitored on a monthly basis by the Site Supervisors, who will arrange a review of local environmental emergency procedures if required.

7.0 Reporting route

The table below indicates reporting routes for various incidents:

Incident	Form	Reporting Route
Environmental/ near miss (as defined above)	ENF 007 - Assure	Assure Portal
Health & Safety accident or near miss (report of any injury or dangerous occurrence) as defined in H&S procedures	N/A	Assure Portal or Near Miss Hotline/SmartHub Risk Team
Potential Pollution of the environment	NOF 030 - WATPOL	SmartHub Risk Team and EA/NRW (Environment Agency/Natural Resources Wales)

8.0 Records

8.1 Records

	Record	Reference	Retained By	Retention Period
2.	Testing Emergency Procedures	ENF 003	EMS file at location/ Intranet Local Documents	3 years
3.	WATPOL	NOF 030 - WATPOL	Pollution Information Advisor	7 years

8.2 References

	Reference	Document Ref
1.	Waste Management	EN (3) 02
2.	Delivery, Handling and Storage of Oils and Chemicals	EN (3) 03
3.	Wastewater Environment Team Internal Guidance	Intranet
4.	Incident Reporting Investigation	HSP 802
5.	Reactively Responding to potential customer reported pollution	NO (3) 26
6.	Incident Response Manual	N/A

ISO Scope and Permitted Sites

EN (3) 05 - Level 3 Procedure

1.0 Purpose and Scope

This procedure defines in broad terms the principles of Environmental Management on Operational Sites, Offices and business areas included in the scope of the DCWW Environmental Management System. This procedure provides guidance with regard to identification of site specific environmental impacts and the development of emergency procedures and waste management plans.

This procedure applies to all sites, offices and business areas that are included in the scope of the Environmental Management System. If your site is ticked under the scope of ISO14001 in the IMS Asset List or has an Environmental Permit then you must comply with this procedure. If your site is does not fall under either of the above, then it is encouraged that this procedure is followed, where appropriate.

2.0 Contents

3.0 Record of Change

Issue Number & Date	Details of Change
	New procedure issued on the 28th May 2015
02, 16th July 2015	Section 4.2 – Training, added to the procedure.
03, 14th March 2016	Section 7.0, amended to reference site Waste Management against EN (3) 02 Waste Management, as this is a requirement of all sites.
04, 10th April 2017	Section 4.1.6 – change made due to legislation that all air conditioning units need to be leak tested and supporting guidance.
05, 18th January 2021	Annual Review of the Procedure

06, 31st March 2021	Section 4.1. updated to include reference to desktop reviews of environmental assessments to update existing EMPs, where an additional activity takes place. Section 5.3 updated

4.0 Site Environmental Management System – IMS Team

4.1 Site Initial Environmental Review & Site Environmental Management Plan

Each operational site and business area included in the scope of the EMS (see SP(1) 01 – Asset List) will be subject to an Initial Environmental Review that will be undertaken by the IMS Team. Initial reviews include a description of the site/business area, a summary of activities and an aspect and impact assessment to determine negative and positive site environmental impacts that need management. Following on from the Initial Review, Environmental procedures are developed, including an Environmental Management Plan that lists specific objectives and tasks for completion by the Compliance/Ops Co-ordinator/Ops Supervisor. (In the event of capitol works on site, the Initial Environmental Review can take the guise of a desktop review of environmental assessments provided to the regulator as part of the planning/environmental permit application/decision process.) This plan is created by the IMS Team. The Environmental Management Plan is subject to review based on the outcome of the ENF008 – Environmental Annual Review. The Environmental Management Plan will be held on the Intranet and shall include reference to the following;

4.1.1 Waste Management

Each business area included in the scope of the EMS is to manage its waste streams and it is our duty to correctly describe our wastes. The Hierarchy of Waste Management must be applied to all waste management activities. The Local Management Procedure must include:

- A list and description of all wastes produced at site
- Reference to the Hierarchy of Waste Management
- A description of the disposal routes (e.g. to landfill or recycling)
- The name of the waste carrier for each classification of waste.
- The location of the site waste management area & the location of any other skips.

4.1.2 Pollution Prevention and Control

Each Local Environmental Management Procedure should include a plan for preventing pollution. Details should include:

- Details of possible sources of pollution: to air, land and water
- Details of pollution prevention activities
- Details of pollution control activities
- Details of the location of spill kits (this may be displayed in the Site Emergency Plan)
- Details of any maintenance or routine checks and their frequency that assist with pollution (Available in SAP)

4.1.3 Resource Management

In some cases, the use of resources would have been identified as a significant environmental impact and therefore, the Local Environmental Management Plan shall include reference to how this is managed. Examples of resources include: paper, chemicals, equipment and materials. Guidance will be included in the Environmental Review.

4.1.4 Energy Management

This is controlled by the Energy Team who manages DCWW's energy production and usage.

4.1.5 Positive Impacts

In some cases, where there are positive environmental impacts from site operations, these should be made reference to in the Local Environmental Management Plan to show how this is managed. Examples of positive impacts include: Solar Panels, Wind Turbines, Hydroelectricity, Gas to Grid through Advanced Anaerobic Digestion etc.

4.1.6 Other factors to be considered;

- Conservation Areas
- Invasive and protected Species
- Any other site specific Environmental impact not covered
- Air Conditioning Units must be leak tested. The guidance can be found here: Guidance for Stationary Refrigeration & Air-Conditioning.

4.2 Training

Each operational employee working on a site certified to ISO 14001, must have completed the IMS Environmental E-Learning package. E-Learning must be refreshed every 3 years or as part of the induction for a new starter. Records of the training will be held within the corporate training database.

5.0 Site Environmental Management System – Compliance/Ops Coordinator

A breakdown of requirements can be found in section 0 which details the responsible person for each record. The Compliance/Ops Coordinator is responsible for all aspects below; however, these could also be carried out by a 'Responsible Person' as would be in non-operational areas.

5.1 Site Environmental Emergency Procedures

Emergency procedures are developed for each EMS site to ensure that any environmental risks are managed and controlled. The environmental risks are identified during the Site Initial Environmental Review and this document will confirm whether emergency plans are required.

It is important that the Emergency Procedures are communicated to all staff (recorded locally) and contractors working on site. Emergency Procedures must be held on the Intranet.

5.2 Briefing and Testing of Environmental Emergency Procedures

Each manager must ensure that all staff are effectively briefed in the use of site-specific emergency procedures.

Emergency Procedures must be tested to ensure that they are fit-for-purpose. It is required that an aspect of the Site Emergency Procedures (e.g. spillage, fire, explosion etc.) are dynamically tested at least annually on all sites which identify the need to have them. A record of these tests and any follow-up actions are to be detailed on ENF 003 – Record of Dynamic Testing and located in the sites EMS file or on the Intranet.

Emergency procedures are bespoke to its respective site. During the annual dynamic testing of emergency procedures site must select a different scenario each time. For example, if in year one a dynamic test involves spillage scenario, the following year a different scenario should be used, perhaps fire. Examples of scenarios can include;

- Fire or smoke on any part of the site/equipment
- Oil Chemical Spillage
- Personal Accident/Injury
- Explosion
- Electric Shock
- Tank Failure

The list is not exhaustive.

6.0 Site Annual Environmental Review

An annual review (ENF008) is undertaken of the EMS at each site/business area by the Compliance/Ops Coordinator. A break-down of this process is available in section 9.0 which shows the process flow.

The purpose of the Annual Review is to:

1) Assess whether Local Plans and procedures have been implemented and maintained
2) Assess whether further aspects and impacts are applicable (e.g. if there has been a change in working practice or process therefore impact to the environment)
3) Close off existing actions and update the Environmental Management Plan

During the Annual review, the compliance/ops Coordinator will assess the site/business area using form ENF 008 – Annual Environmental Review and forward to the IMS team. In the event of an identified change, the IMS team will assess the impact, ensuring appropriate controls are in place to mitigate the risk and update the Environmental Management Plan.

6.1 Annual Environmental Review Tracking

As part of the review process the IMS Team will track each EMS site regarding their reviews and issue prompts to ensure that all the above requirements are met within the specified timelines.

7.0 Waste Management

Each EMS site must have a Waste Management Plan that includes details of the types of waste produced at site, how wastes are segregated, stored and removed from site.

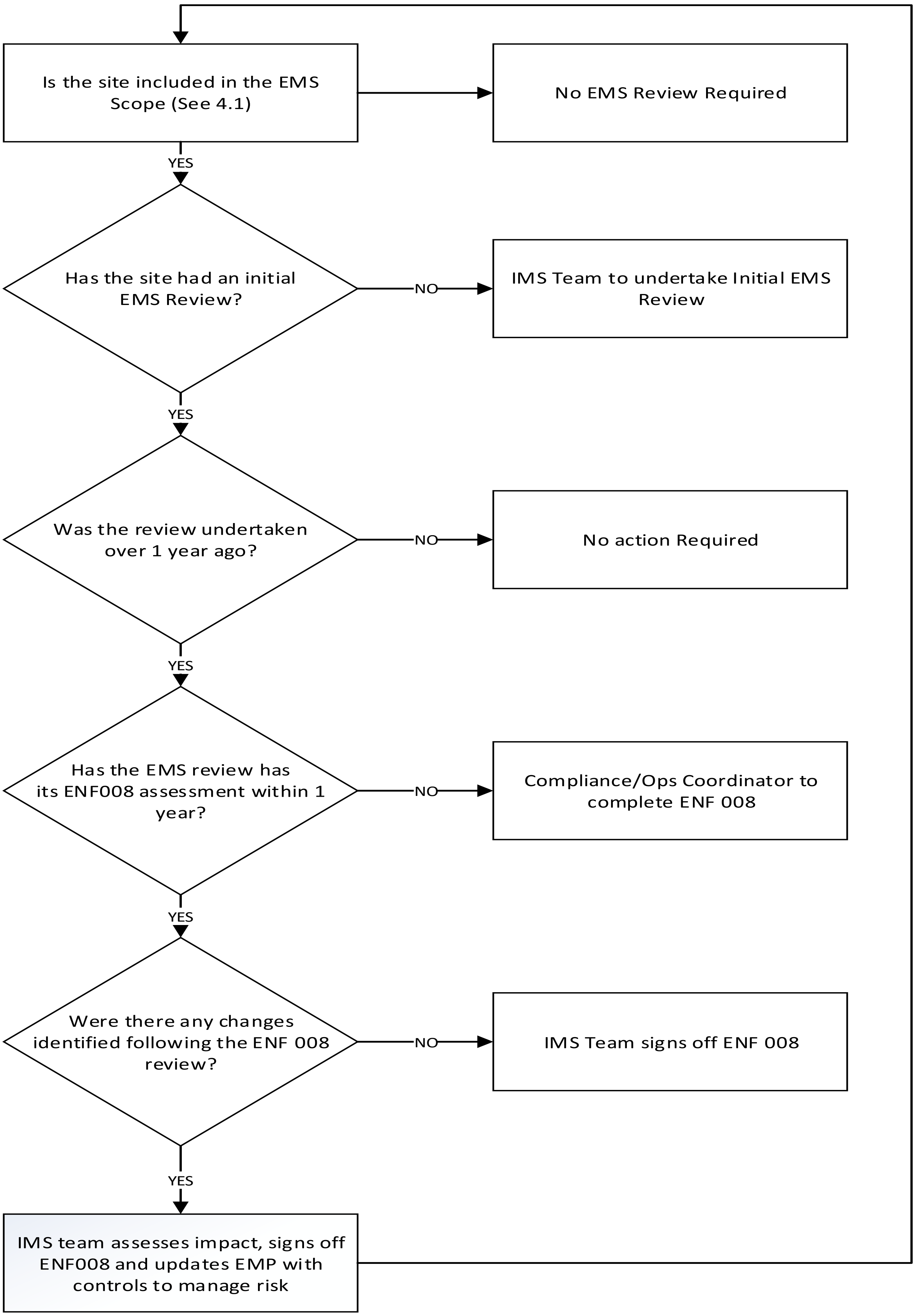
Procedure EN (3) 02 – Waste Management, must be followed with regards to the handling, storage and removal of waste and hazardous waste, from operational sites. Section 4.0 discusses the Waste Management Hierarchy, section 4.1 discusses the requirements for Non-Hazardous Waste, section 4.2 discusses the requirements for Hazardous Waste, section 4.3 discusses the removal of waste from site and section 4.4 details information about Waste Transfer Notes. The Waste Management procedures applies to all operational sites as it is not a ISO14001 requirement to segregate and dispose of waste correctly, it is the requirements of legislation.

8.0 Records maintenance

Document or Record	Created/Updated/ Maintained By	Responsible for Review

Site Initial Review	IMS Team	IMS Team
Site Environmental Management Plan (Section Error! Reference source not found.**)**	IMS Team	IMS Team
Site Emergency Procedures (Section 5.1)	Compliance/Ops Coordinator/IMS Team	Compliance/Ops Coordinator/IMS Team (when required)
ENF 003 – Testing of Emergency procedures (Section 5.2)	Compliance/Ops Coordinator	Compliance/Ops Coordinator (Annually)
ENF 008 – Annual Environmental Review (Section 6.0)	Compliance/Ops Coordinator/IMS Team	Compliance/Ops Coordinator/IMS Team (Annually)
Waste Transfer Documents (Hazardous/Non-Hazardous)	Compliance/Ops Coordinator/Waste Carrier	N/A

9.0 Appendix 1 – Environmental Review Requirements



Emergency Procedures

1.0 Dwr Cymru Welsh Water Procedures

All environmental incidents occurring on site, including near hits/misses should be reported on form ENF007 available on the Infozone to the Op's Supervisor and the IMS Team in accordance with Welsh Waters EN(3) 04 Environmental Incidents – Near Miss Procedure.

All health and safety related incidents, including near hits/misses should be reported following the HSP802 procedure. All employees will:

i. Inform Team Leader/Line Manager of all injuries and incidents immediately;
ii. Use the Assure database on the Infozone to log a Near Miss, or contact the Near Miss Hotline (01443 452800) about any unsafe acts or conditions and dangerous situations they notice.
iii. Co-operate with the investigation process

1.1 Minimum PPE Requirements

The minimum PPE Requirements at Queensferry WWTW are as follows:

- Protective Footwear
- Protective Gloves
- Hi Visibility Jackets
- Eye Protection must be worn where assessed
- Ear Protection must be worn where assessed

Further site rules:

- No Mobile Phones
- No Ignition Sources
- Personal Gas Monitors must be worn if working in the CHP containers, Bio methane Gas Bag and/or on the Digesters.

1.2 Site Specific Procedures

Queensferry WWTW

1.2.1 FIRE OR SMOKE ON ANY PART OF THE PLANT

Fire detection systems are installed on site, and linked to telemetry control.

Actions:

1. Tackle the fire **only** with the correct fire equipment and training and **only** if it is safe to do so. IF IN DOUBT- GET OUT –then:

2. Call the fire services on **999**, stating the site address as

Queensferry WWTW
Factory Road
Pentre
Deeside
Flintshire
CH5 2QJ

Also give the O/S Grid Reference: SJ 3238068530

3 Leave the area by the **nearest exit**: Do not stop to collect clothing or belongings.

4 Proceed by the shortest route to the fire assembly point located on the grass area situated in front of the office building and await roll call.

5 The names of any personnel not accounted for at the roll call and any other information as necessary must be given to the Senior Officer of the emergency services immediately upon his/her arrival at the scene.

6 Inform your Operations Supervisor at the earliest opportunity.

7 Complete and forward an ENF007 form to the Op's Supervisor and the IMS Team, on the day of the environmental incident/near miss who will record on Assure.

Roll call

1 The person in charge of the workforce will ensure that they are all accounted for.

2 The person in charge of any group of visitors will ensure that they are all accounted for.

1.2.2 OIL/CHEMICAL SPILLAGE

In the event of a MINOR spill, or one that will not enter the watercourse, or present an immediate fire/pollution hazard:

1 See the relevant COSHH data sheets for details regarding contact with the substance spilled, clean-up/disposal and PPE requirements. These are attached.

2 Use the Spill Kits provided at various locations around the site to contain the spill immediately. An instruction sheet is contained in the kit that details what type of absorbents is appropriate for which circumstances.

3 If considered necessary, stop production and:-

4 Inform line manager as soon as possible, giving details as to type and quantity of oil/chemical spilled. The line manager will inform other authorities such as the Environment Agency as appropriate.

5 Complete and forward an ENF007 to the Op's Supervisor and the IMS Team, on the day of the environmental incident/near miss. If there are H&S issues, record on Assure.

6 **All waste will be disposed of in line with appropriate legislation and company policy**.

In the event of a MAJOR spill, or one that will present an immediate fire/pollution/explosion hazard:

2 **Stop production immediately (if appropriate).**

2 See the relevant COSHH data sheets for details regarding contact with the substance spilled, cleanup/disposal and PPE requirements. These are attached.

3 Contain oil/chemical as best as possible using the spill kits provided at various locations around the site (refer to site plan).

4 In the case of a fire hazard, smother substance using the appropriate fire extinguisher.

5 Inform line manager as soon as possible, giving details as to type and quantity of oil/chemical spilled. The line manager will inform other authorities such as the Environment Agency as appropriate.

6 Complete and forward an ENF007 to the Op's Supervisor and the IMS Team, on the day of the environmental incident/near miss. If there are H&S issues, record on Assure.

1 **All waste will be disposed of in line with appropriate legislation and company policy**.

1.2.3 PERSONAL ACCIDENT/INJURY

Actions:

Dependent upon the seriousness of the injury, either:-

a. Call **999** and ask for the Ambulance Service
State address as:-

Queensferry WWTW
Factory Road
Pentre
Deeside
Flintshire
CH5 2QJ

Also give the O/S Grid Reference: **SJ 3238068530**

Or:-

b. Go to the nearest (24 hour) Accident and Emergency Unit at the following hospital:-

Countess of Chester Hospital,
Liverpool Road,

Chester
CH1 1UL

Tel: **01244 365000 (24hr A&E)**

Or:-

c. If the injury is only minor (e.g. minor cut or abrasion), and there is a competent and currently certified First Aider on the site, the injury can be treated utilising the First Aid kit located in the mess room or workshop.

In all cases

Report the accident initially to your Line manager to co-ordinate the incident information.
Depending on the severity of the accident or injury, in accordance with DCWW's Health and Safety Procedure, all health and safety related incidents, including near hits/misses must be reported to the health and safety department which is available on the DCWW Infozone site.

1.2.5 FIRST AID KIT

These are located as follow:-

Mess Room

Workshop

Operational Vehicles

1.2.6 EXPLOSION / OTHER EMERGENCIES

1 In the event of an explosion or other critical emergencies, all personnel must evacuate the area immediately.

2 The emergency services must the called immediately on **999** giving the location of the site as:-

Queensferry WWTW
Factory Road
Pentre
Deeside
Flintshire
CH5 2QJ

3 Also give the O/S Grid Reference: **SJ 3238068530**

4 All personnel must go to the fire assembly point located on the grass area situated in the front of the main office building and await roll call.

5 The names of any personnel not accounted for at the roll call must be given to the Senior Officer of the emergency services immediately upon his/her arrival at the scene.

6 The Op's Supervisor must be informed of the full details as soon as is practicable in the circumstances. He will assume control and will coordinate actions in accordance with Welsh Waters emergency procedures.

7 Complete and forward an ENF007 to the unit manager and the IMS Team, on the day of the environmental incident/near miss.

1.2.7 ELECTRIC SHOCK

In the event of an accident involving electric shock, the following actions should be taken:

1 If the power has not tripped automatically isolate power locally.

2 If for any reason it is not possible to isolate the power locally then shutdown main source of power on mains incomer.

3 Summon the emergency ambulance service on **999** giving the location as follows:

Queensferry WWTW
Factory Road
Pentre
Deeside
Flintshire
CH5 2QJ

Also give the O/S Grid Reference: **SJ 3238068530**

4 The injured person can only be removed from a live electricity source if rescue personnel are equipped with:
   a. heavy duty rubber gloves and
   b. dry rubber footwear and/or
   c. dry rubber or thick non-conductive matting and/or
   d. dry, bare timber and/or other non-conductive material.

5 If it has been possible to remove the injured person from the live source, first aid resuscitation treatment must be rendered without further delay by a competent First Aider and continued until the arrival of the emergency paramedics

6 If the power source is still live, isolate the area to prevent access by any other personnel

7 The accident must be reported to the Operations Supervisor as soon as is practicable.

8 The accident must be reported to the health and safety department, in association with HSP 802.

1.2.8 Emergency Phone Numbers

Emergency Services - **999**

DCWW Near Miss Hotline - **01443 452800**

Dŵr Cymru Welsh Water

Queensferry WwTW

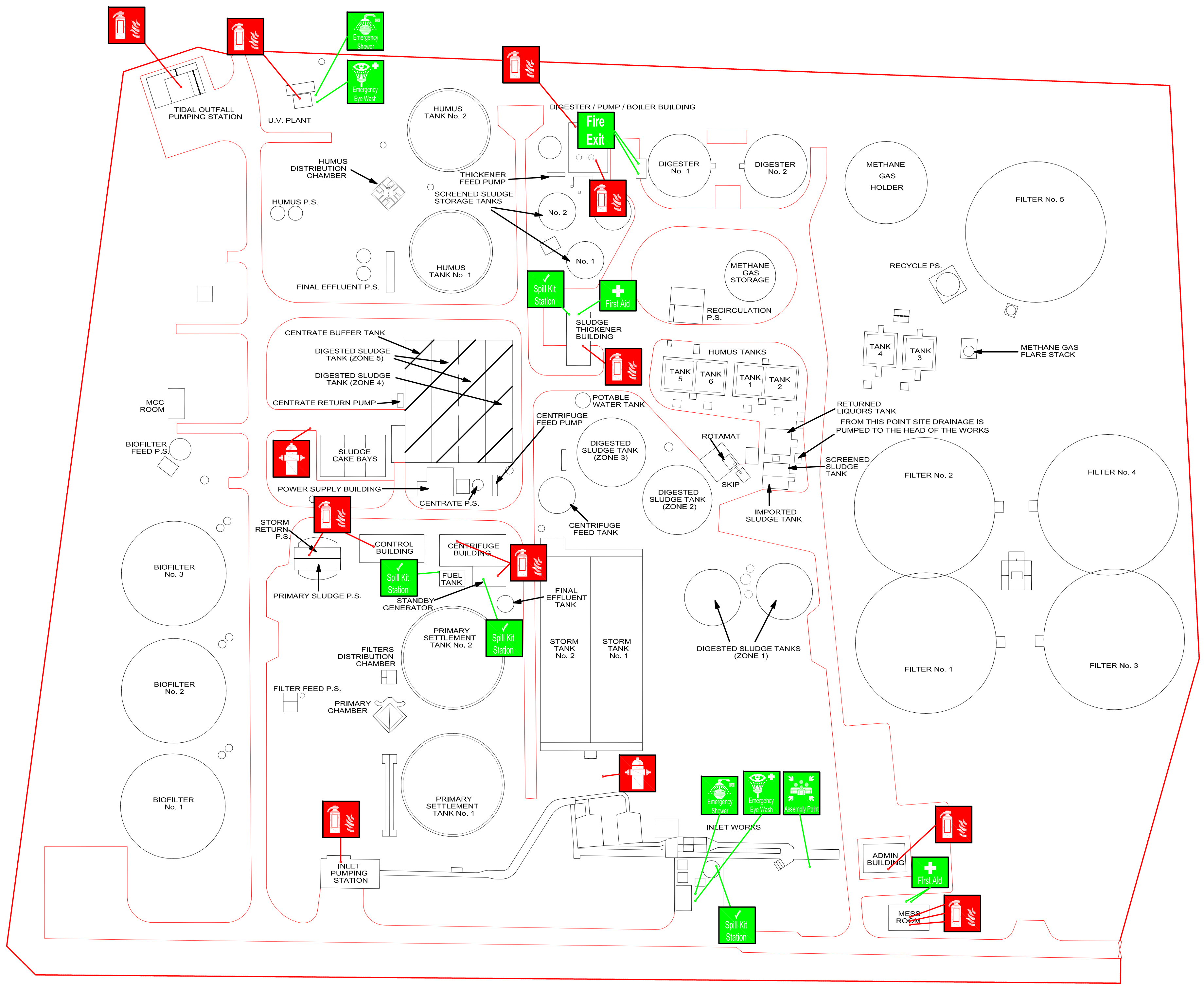
Site Emergency Information

Drawing & Schematics

Queensferry Site Drawing

Site Emergency Plan

- FIRE ASSEMBLY POINT
- BREATHING APPARATUS
- EMERGENCY SHOWER
- EMERGENCY EYE WASH
- FIRE EXIT
- FIRE EXTINGUISHER
- FIRE HYDRANT
- FIRE BLANKET
- FIRE HOSE
- FIRST AID KIT
- SPILL KIT
- WIND SOCK



This Service is provided to the business by: IMS and Asset Information

Dŵr Cymru Welsh Water	**Queensferry WwTW** **Digester Safety Instructions**	PRINCIPLE BIOGAS

Emergency Instructions for Containing and Controlling Digester Emergencies

These instructions deal with different types of emergencies, classified into three levels of severity (where appropriate). These levels are SLIGHT, MODERATE and SEVERE. The instructions are intended to be a step by step guide to help operators take the right action in emergency situations.

These instructions are written with the best possible technical input, but the reality of any given emergency will be different, and responding staff are required to make their own risk assessments, using the instruction sheets as guidance for identifying potential hazards. They are intended to help operators to bring the AD facility into as safe a condition as possible in the event of an emergency They are not intended to provide detail on full recovery from an emergency. This must be assessed on a case by case basis. Where PPE is referenced, this means the equipment required to be worn under site rules & induction.

How to use these instructions:

On each sheet, follow the instructions in order. This is important as some actions are dangerous if done out of sequence:

Classify the emergency: Look at the situation and determine its severity and the appropriate course of actions.
Prepare: Take a step back. Think about where people need to be kept away from, and what the hazards the emergency is creating. Think about who should be contacted before any remedial action is taken. An emergency equipment store exists on site, and should be used appropriately as the situation demands.

Contain: Depending on the severity of the emergency, this section gives guidance on measures to stop the situation from getting any worse.
Control: Measures to bring the situation under control directly, or control the area around the emergency
Consolidate: Actions to take once the situation is under control. Actions which start the site on the road to recovery.
The term "site supervisor" is used throughout these instructions to refer to the person responsible for the site at the time of the incident. DCWW policy is that during normal working hours then this is the duty Digester Safety Controller. Outside of working hours, telephone SmartHub, and ask for the Bronze Level Manager.

DCWW Internal Contacts:

Duty	Name	Contact Number
Site Supervisor	Jason McKeown	07788 361 428
Designated Digester safety Controllers	Frank Esposito	07771 353 195
Smart Hub	Various	0303 313 0103
Logistics	Various	07774 223 671
Specialist support will at times be required for these instructions:		
Mechanical, electrical, biological and process problems (24 hrs)	Principle Biogas	0333 207 9991
CHP	Centrica	
Local Fire service (non emergency)	Dee side Fire Station/ Gorsaf Dan	01244 813 512
Fire & Emergency	Fire Service	999
Environmental Impact	Natural Resources Wales	0345 988 1188

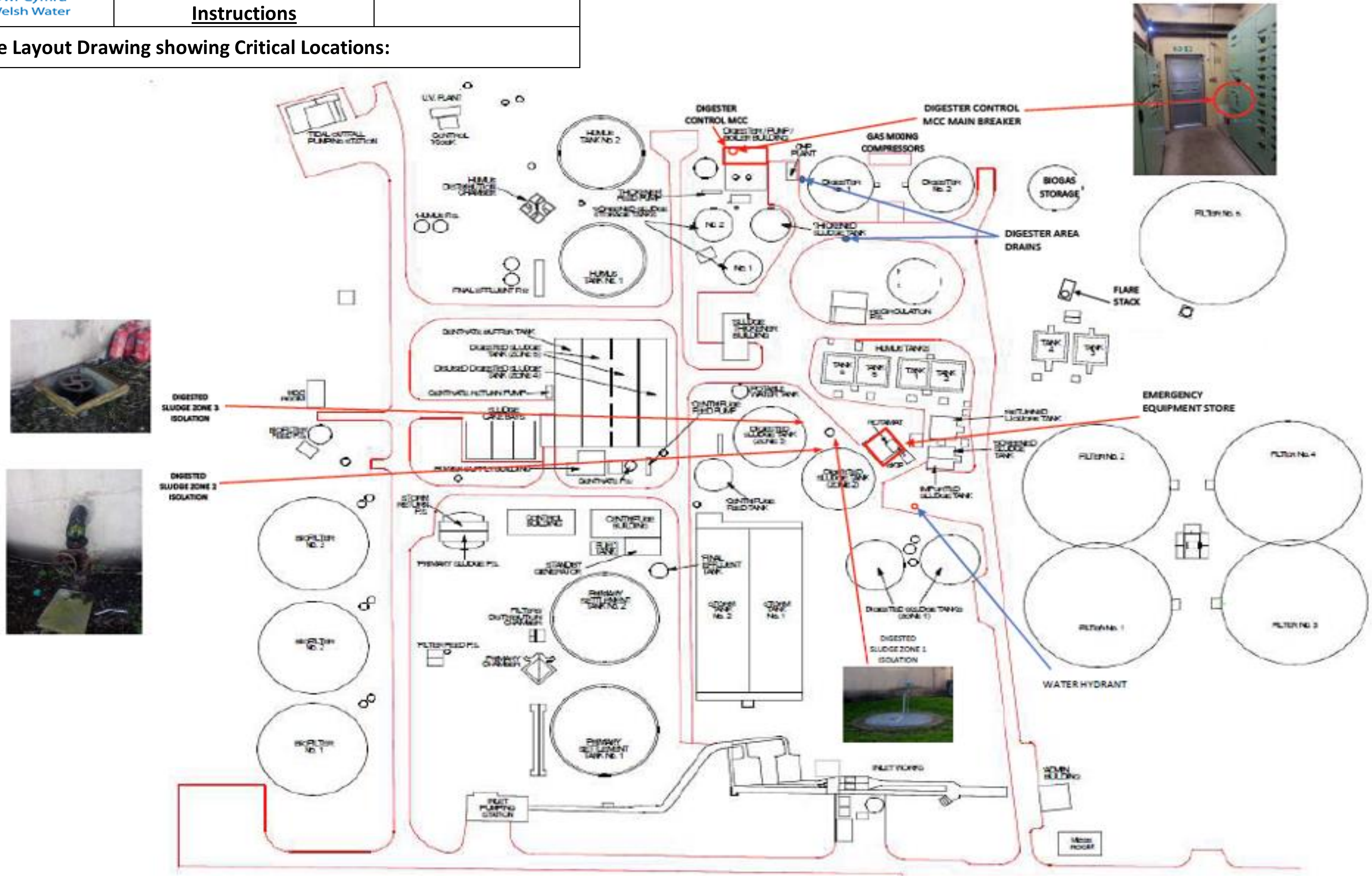
Dŵr Cymru Welsh Water	**Queensferry WwTW** **Digester Safety Instructions**	PRINCIPLE BIOGAS

Contents Page:

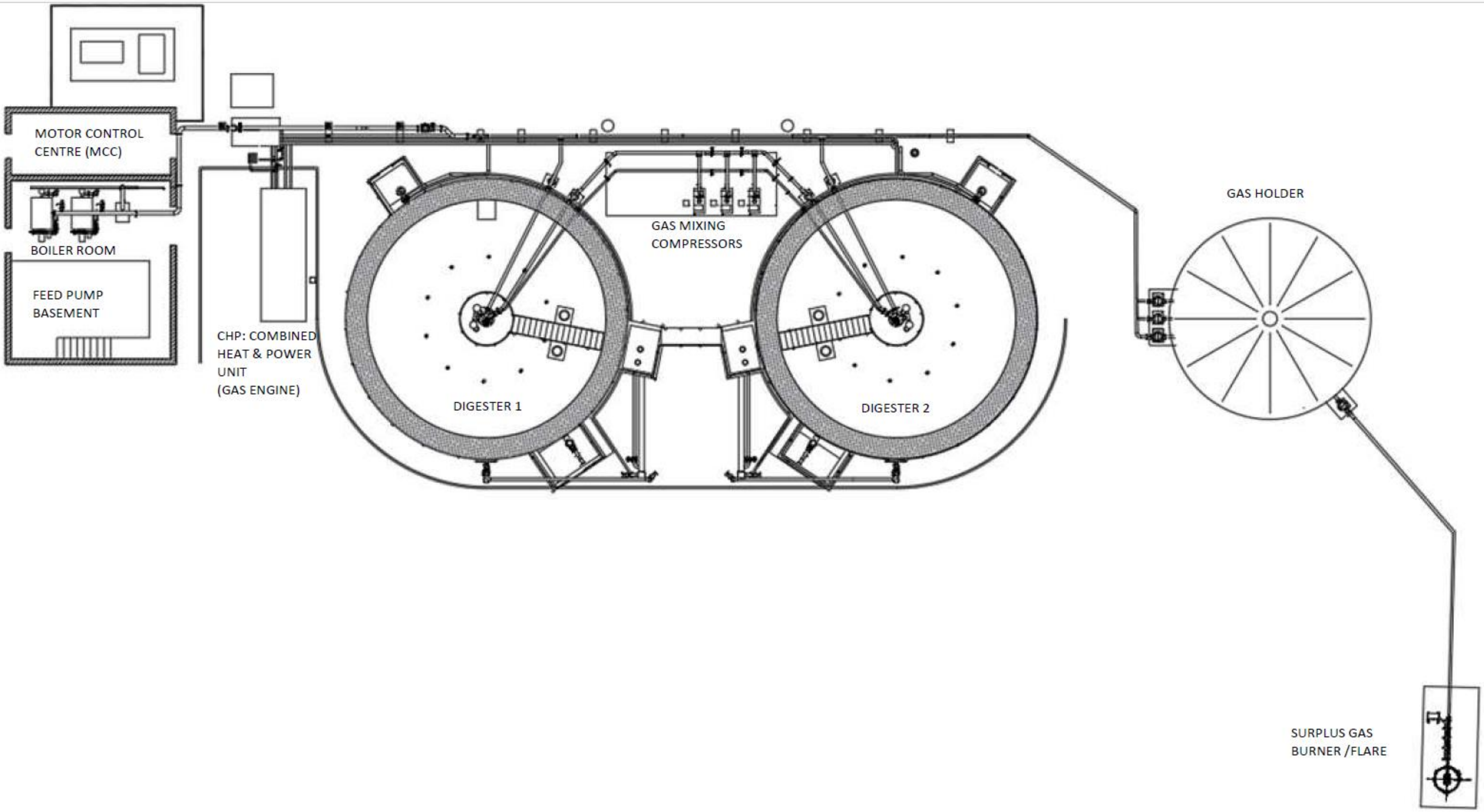
Dŵr Cymru Welsh Water	**Queensferry WwTW** **Digester Safety Instructions**	PRINCIPLE BIOGAS
Anaerobic Digestion Facility Site Specific Hazards:		
Biogas	This site produces biogas by a biological process. The production of biogas can only be stopped over a period of days by significant process intervention. Biogas is present on site in the concrete digester head spaces, the green double membrane gas holding sphere and the connecting pipes and equipment. The risks associated with biogas are described below. See Potentially Explosive Atmospheres drawing of site for detail.	
Toxic Gas	Hydrogen Sulphide is present in biogas in harmful quantities. It is harmful through inhalation and is an eye irritant. Where gas leaks or releases may be present personnel must wear a personal gas monitor and evacuate the area if it alarms.	
Flammable Gas	Biogas contains methane (40-60%) and is therefore flammable when mixed with air. Where biogas leaks or is vented from the process controls must be in place to prevent sparks or other sources of ignition.	
Asphyxiants	Where biogas is vented in large quantities it will displace the oxygen from the atmosphere local to this release. Where gas leaks or releases may be present personnel must wear a personal gas monitor and evacuate the area if it alarms.	
Sewage Sludge	Sewage sludge contains many bacteria and viruses which are harmful to human health. Avoid direct contact with sludge and digestate. Do not ingest. If contact occurs, wash immediately with water and soap. If flu like symptoms occur after exposure to sludge, consult a doctor and alert them that you are at risk of Weil's disease.	
Hot Water	Hot water is present on site, operating at 70-90 deg. C, 1-3 bar(g). Systems are fitted with pressure relief devices. If water is released from the system, direct contact must be avoided until it has had time to cool.	
PPE & Other Requirements	Steel Toe Capped Boots High Visibility Vest/Jacket or similar Gloves (task appropriate) Personal gas monitor (CH_4,H_2S,CO,O_2) Eye Protection (task specific) Ear Protection (task specific) Bump Cap/Hard Hat	

Dŵr Cymru Welsh Water	**Queensferry WwTW** **Digester Safety Instructions**	PRINCIPLE BIOGAS
Emergency Equipment Register:		
The following equipment is recommended to be held on site in a dedicated stores. Location of the equipment is shown on the layout plan on page 5		
Equipment:	ATEX rated torch and spare batteries Cones/Barriers 100 m barrier tape Fire Extinguisher (CO_2 digester control room) Fire Extinguisher (CO_2 boiler room) Marker chalk 4 x 20 m water hoses Gaskets : 80 mm x2 100 mm x2 150 mm x2 200 mm x2 250 mm x2 300 mm x2 Isolation pack x6 (Padlocks, tags, keys) Sandbags 1 x full bottle of leak detection fluid Gas analyser (calibrated & charged) "Authorised Access Only" signs x3 and cable ties Spill kits Personal gas monitor x1 (fully charged)	

Dŵr Cymru Welsh Water	**Queensferry WwTW Digester Safety Instructions**	PRINCIPLE BIOGAS
Site Layout Drawing showing Critical Locations:		



Dŵr Cymru Welsh Water	**Queensferry WwTW** **Digester Safety Instructions**	PRINCIPLE BIOGAS		Site layout drawing to assit with action planning and exclusion zone identification
Anaerobic Digestion Process Layout:				

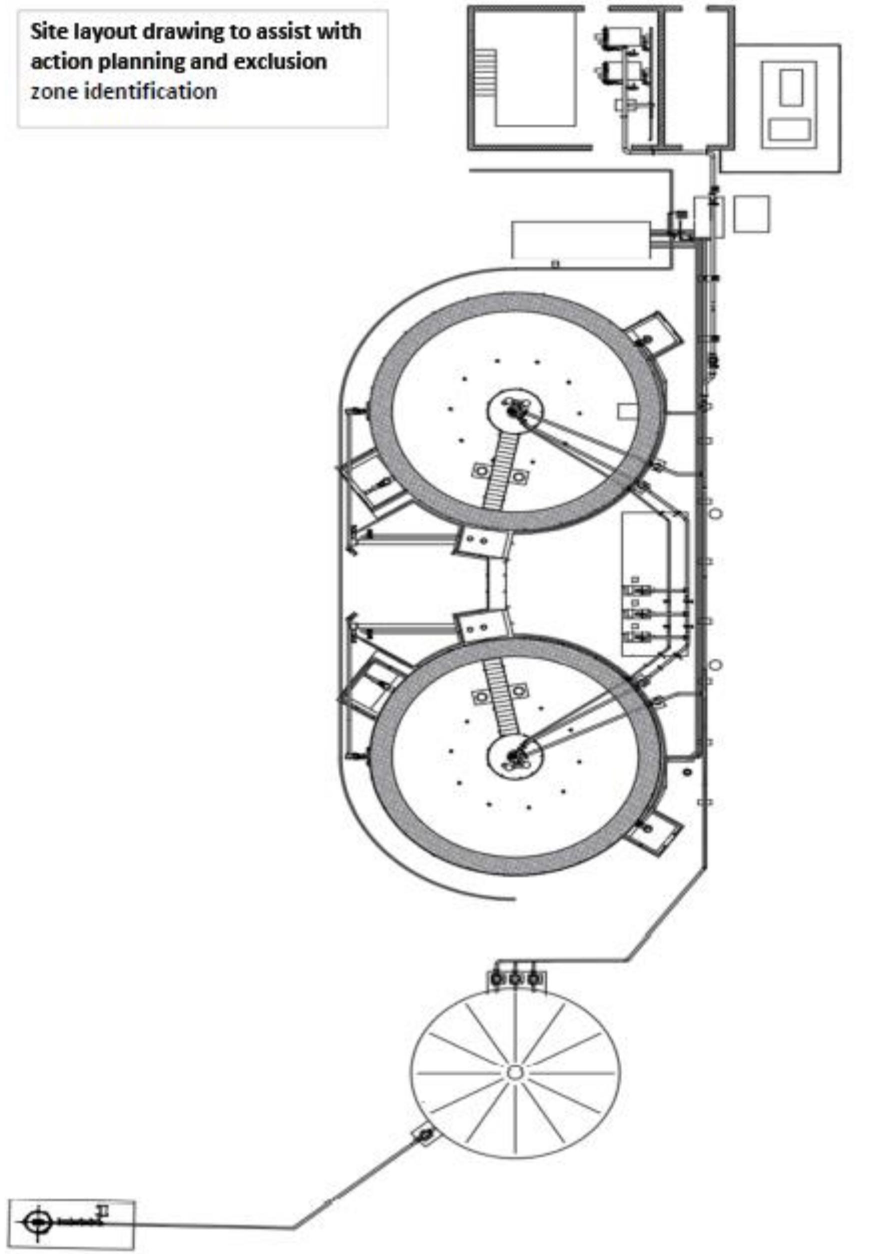


Dŵr Cymru Welsh Water	**Queensferry WwTW** **Digester Safety Instructions**	PRINCIPLE BIOGAS

Emergency Instructions for MECHANICAL DAMAGE

	Prepare
Evacuate:	Clear people from the area. If the damage is a vehicle strike turn off the ignition and leave the vehicle in situ. Equipment and machines to be turned off/made safe as staff leave the area.
Assess the risk:	Is there a fire or the risk of fire? Identify the equipment damaged: is it sludge, gas or water equipment? Is there a risk of the damage becoming worse? Could a sludge release also release gas? NB digesters drained to 83% will vent gas through the high-level overflow.
Communicate:	Call the emergency services if required to deal with casualties, fire or risk of fire.
Equipment:	Assess the situation and gather equipment appropriately.
	Contain
Actions:	Make suitable isolations as far as is safe and practical (valves and isolators). See emergency action sheet for relevant system(s) damaged and take actions accordingly. Only remove vehicles or other equipment from the area once the necessary isolations have been made.
Advice:	Be aware of potential complex issues due to damage to more than once system. If in doubt evacuate the area, maintain a safe distance and call for help. Contain any sludge spilt as far as possible without compromising safety.
	Control
Action:	Be prepared to act as a point of contact for emergency services, vehicle drivers, sub-contractors etc. while the site is being evacuated and made safe until a site manager can take over the co-ordination responsibilities.
	Consolidate
Action:	Establish a clear understanding of what happened in the lead up to the damage occurring. Record what you know about the incident. Gather eye witness reports and any relevant process information.

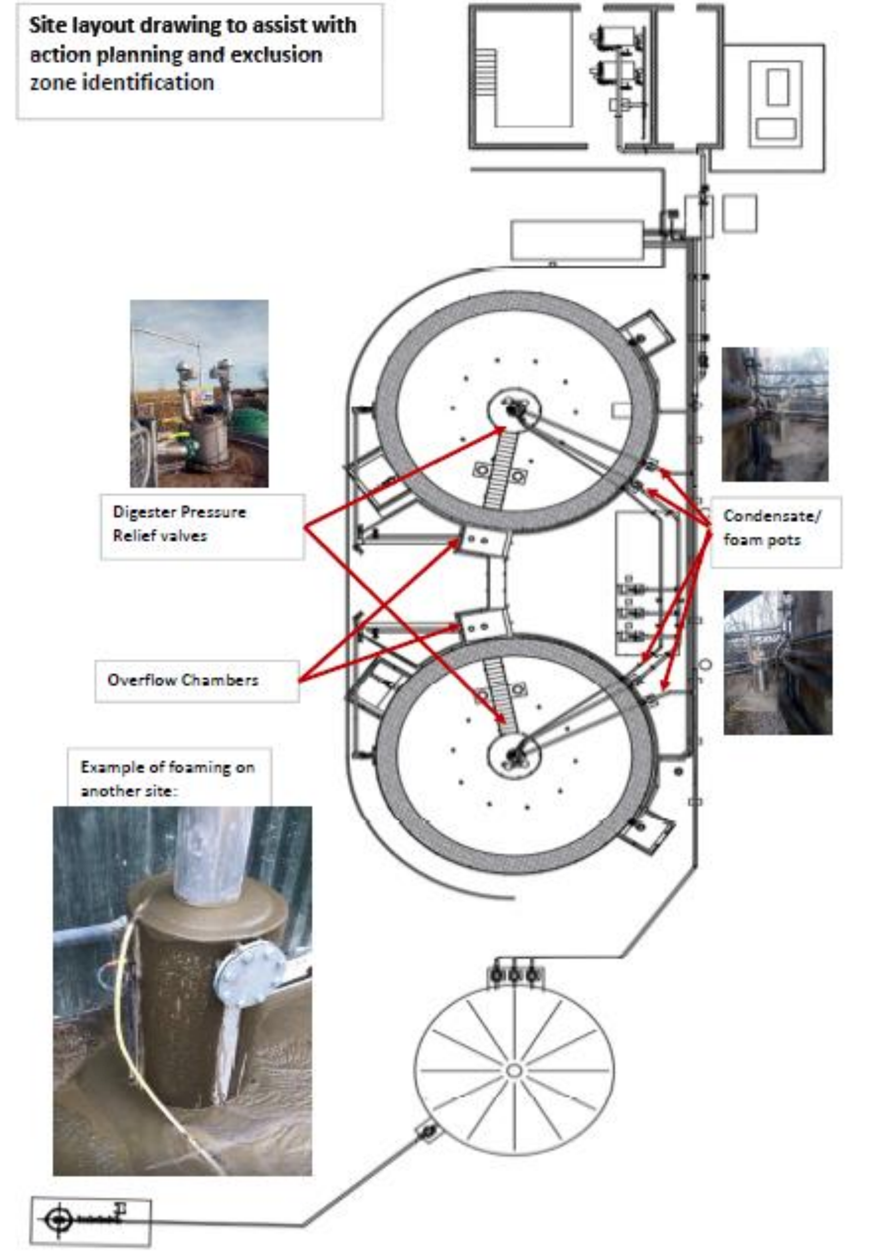
Site layout drawing to assist with action planning and exclusion zone identification



Dŵr Cymru Welsh Water	**Queensferry WwTW** **Digester Safety Instructions**	PRINCIPLE BIOGAS

Emergency Instructions for Foaming

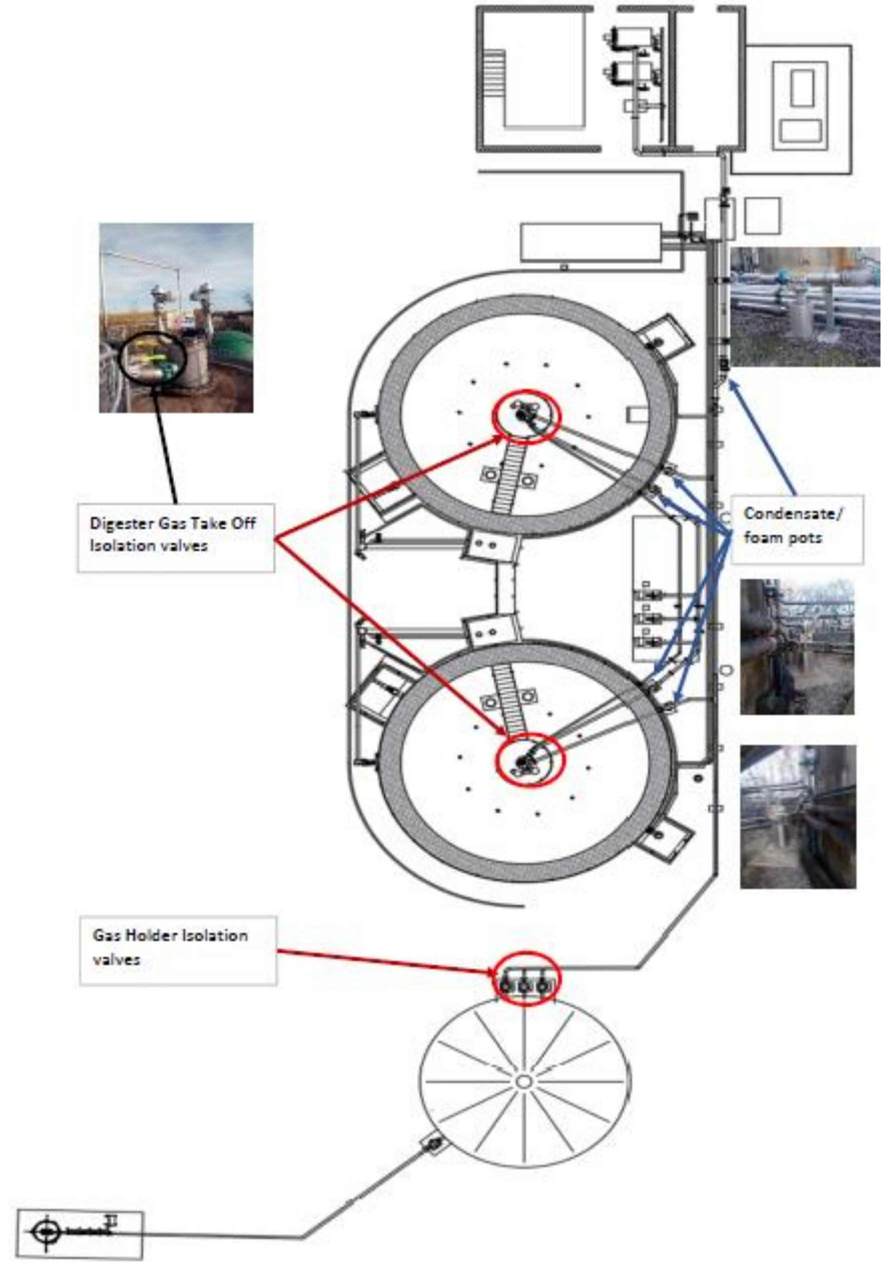
	Classify the Emergency
Measure:	Observation of any of the below may indicate foaming: - Sludge/foam evident in condensate pots, PRVs, overflow chambers. - Spurious high/low levels on the digester level - Gas mixing compressor(s) tripping on low pressure
	Prepare
Evacuate:	Clear the digester roof area. Only authorised personnel to be present in the digester area.
Assess the risk:	Look at the areas identified on the drawing opposite. These are places where foam may exit the digester.
Communicate:	Call site supervisor to alert them of the situation. Call logistics and cancel all tanker deliveries. Have logistics compile a record of all tanker delivery sources.
Equipment:	PPE, gas monitor, cones and barrier tape, spill kits, portable pumps and hoses.
	Contain
Actions:	Stop feeding both digesters.
Advice:	If digester has been mixing normally – mix continuously. If digesters have had long intervals between mixing – mix intermittently.
	Control
Action:	Observe digester level transmitter- if it is showing greater than 100 %, or less than 85%, prohibit access to the rooves. Turn off CHP & boilers. Use Flare to manage high gas holder level. Set up hoses to run into foam pots to keep them clear and prevent water seal loss
Advice:	When foaming subsides, digester level may drop rapidly. Ensure that gas holder is kept relatively full to make up this volume as best possible. Spillage during foaming is inevitable. Focus on protecting the tank structure and any potential pollution to a water course not the mess.
	Consolidate
Action:	Once foaming is under control and has subsided, begin clear up. Gather information on digester feed, mixing and levels for up to 48 hrs prior to foaming incident.



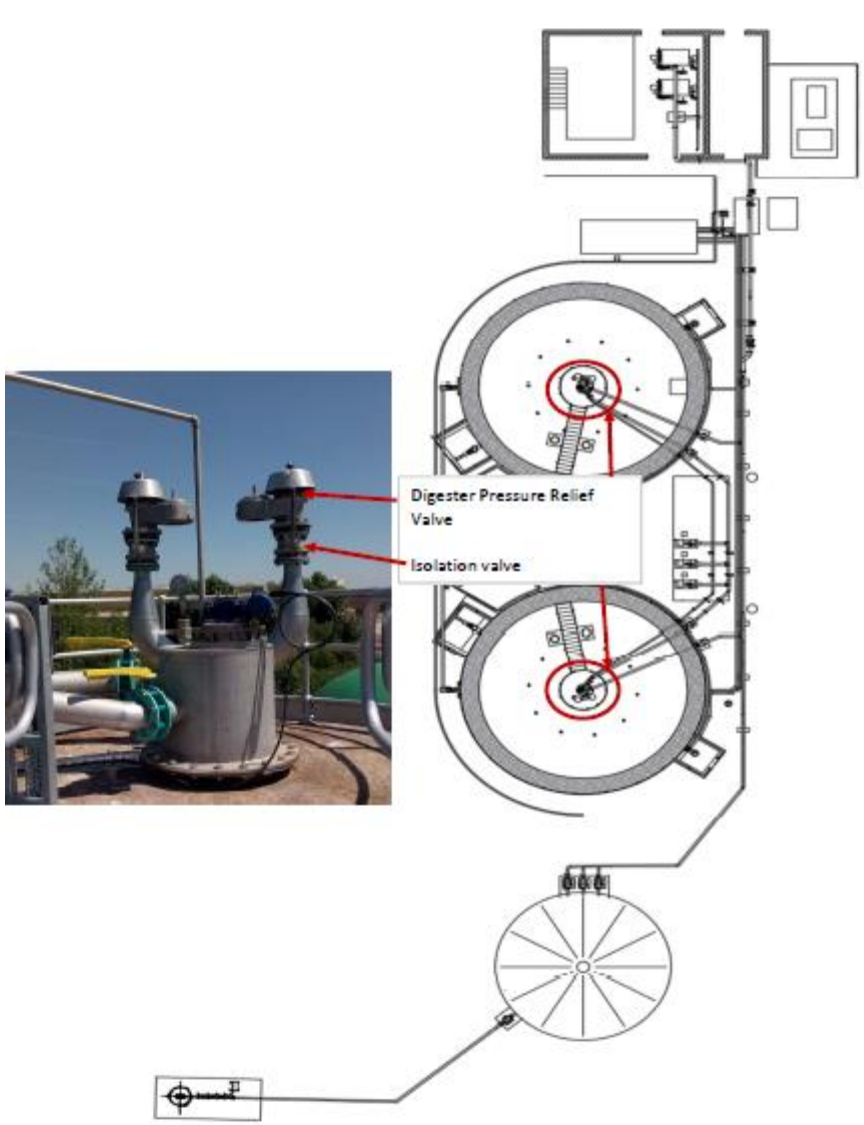
Dŵr Cymru Welsh Water	**Queensferry WwTW** **Digester Safety Instructions**	PRINCIPLE BIOGAS

Emergency Instructions for Condensate/Foam pot blowout

	Classify the Emergency
Measure:	HMI shows gas holder low level, gas holder methane detector is not in alarm state, CHP, flare & boilers not running. Possible smell of biogas, wet area around a condensate pot.
	Prepare
Evacuate:	Gas mixing compressor area.
Assess the risk:	What direction is the wind blowing in? (Approach from upwind).
Communicate:	Alert line manager confirm wind direction and estimated duration of gas release.
Equipment:	Personal gas monitor, water supply and hoses.
	Contain
Actions:	Turn off gas mixing at control panel. Check all condensate pots for blow out, isolate any identified from the biogas system (up & downstream). *Upstream* – roof level. *Downstream* – gas holder
Advice:	Approach with caution as biogas may still be venting. Looks for audible and visible signs such as splashing/bubbling.
	Control
Action:	Re-fill condensate pot with water until overflow level is reached. Check all condensate pots. Open all isolation valves and confirm water seal is holding. Check for any mechanical damage.
Advice:	
	Consolidate
Action:	Inform line manager that system is no longer venting and is in recovery. Monitor gas holder level to ensure that it rises, and that equipment re-starts appropriately. Tally the number of times a pot has blown. For repeat incidents, call specialists to examine the installation and instigate remedial actions. *Digester 1 take off* — *Gas holder header* — *Boiler house/CHP* *Digester 1 gas mixing* — *Gas holder consumers 1* *Digester 2 take off* — *Gas holder consumers 2* *Digester 2 gas mixing* — *Gas holder flare*

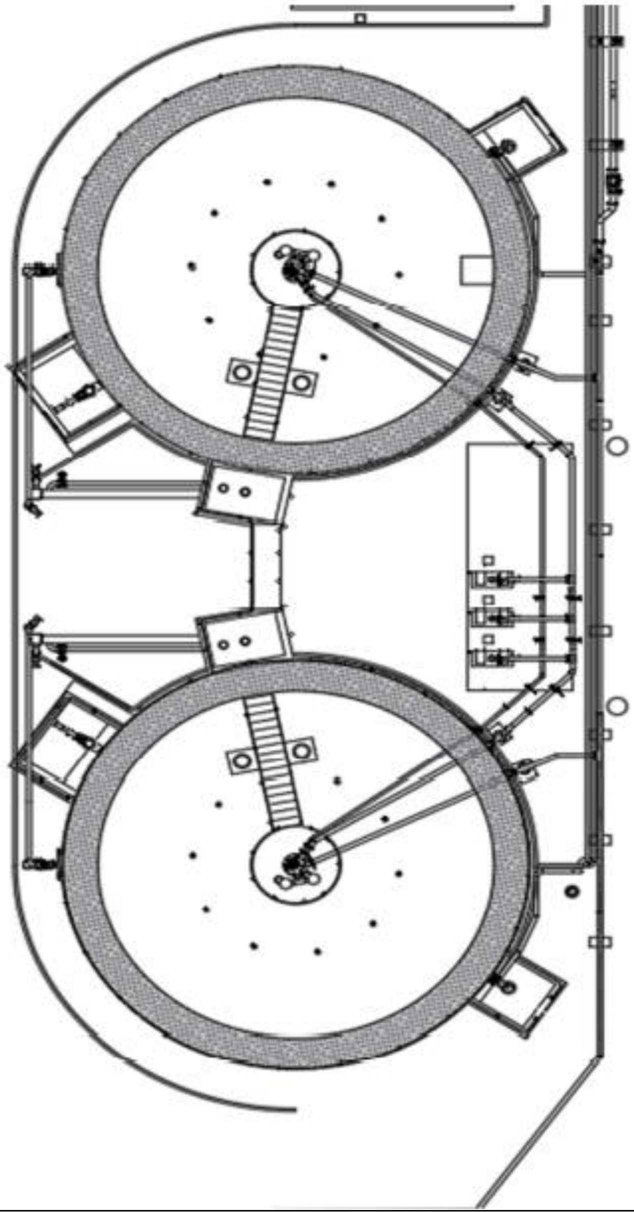


Dŵr Cymru Welsh Water	**Queensferry WwTW** **Digester Safety Instructions**	PRINCIPLE BIOGAS	
Emergency Instructions to Control Pressure Relief Valve (PRV) Leak			
Classify the Emergency			
Measure:	Slight	Moderate	Severe
	Personal gas monitor alarms at 0.5 ppm	Personal gas monitor alarms at 0.5 ppm	
Prepare			
Evacuate:	Digester Roof		
Assess the risk:	Wind strength & direction. Strong wind will make a release safer but could also mask a big release.		
Communicate:			
Equipment:	PPE & gas monitor		
Contain			
Action:		Ensure other PRV is online, then isolate leaking PRV. UNDER NO CIRCUMSTANCES MAY BOTH PRVs BE ISOLATED SIMULTANEOUSLY. Approach and operate valve from upwind	
Control			
Action:	Monitor biogas system pressure, if it drops to below 20mbar, treat as moderate.		
Advice:			
Consolidate			
Action:	Call statutory maintenance team and arrange for valve servicing to be brought forward.	Call statutory maintenance team and request intervention ASAP.	



Dŵr Cymru Welsh Water	Queensferry WwTW Digester Safety Instructions		PRINCIPLE BIOGAS
Emergency Instructions for Biogas leaks detected on digester roof			
Classify the Emergency			
Measure:	Slight	Moderate	Severe
	Personal gas monitor alarms. Bubbles in wet weather.	N/A	Personal gas monitor alarms at 1 ppm
Prepare			
Evacuate:	Digester Roof		
Assess the risk:	Is the release identifiable? How big is it? Is the wind masking it?		
Communicate:	To line/bronze manager.		
Equipment:	PPE, gas monitor, leak detection fluid, marker/chalk.		
Contain			
Action:	Monitor leak size and location.	Monitor leak size and location.	Stop feeding the digesters. Restrict access to the roof.
Control			
Action:	Consult specialists – may be possible to reduce severity by reducing operating pressure.		Schedule repair works.
Advice:	Caution advised on safe and effective live repairs as difficult to achieve.		
Consolidate			
Action:			
	Record leak dates and monitor any deterioration.		

Use diagram below to show approximate leak location



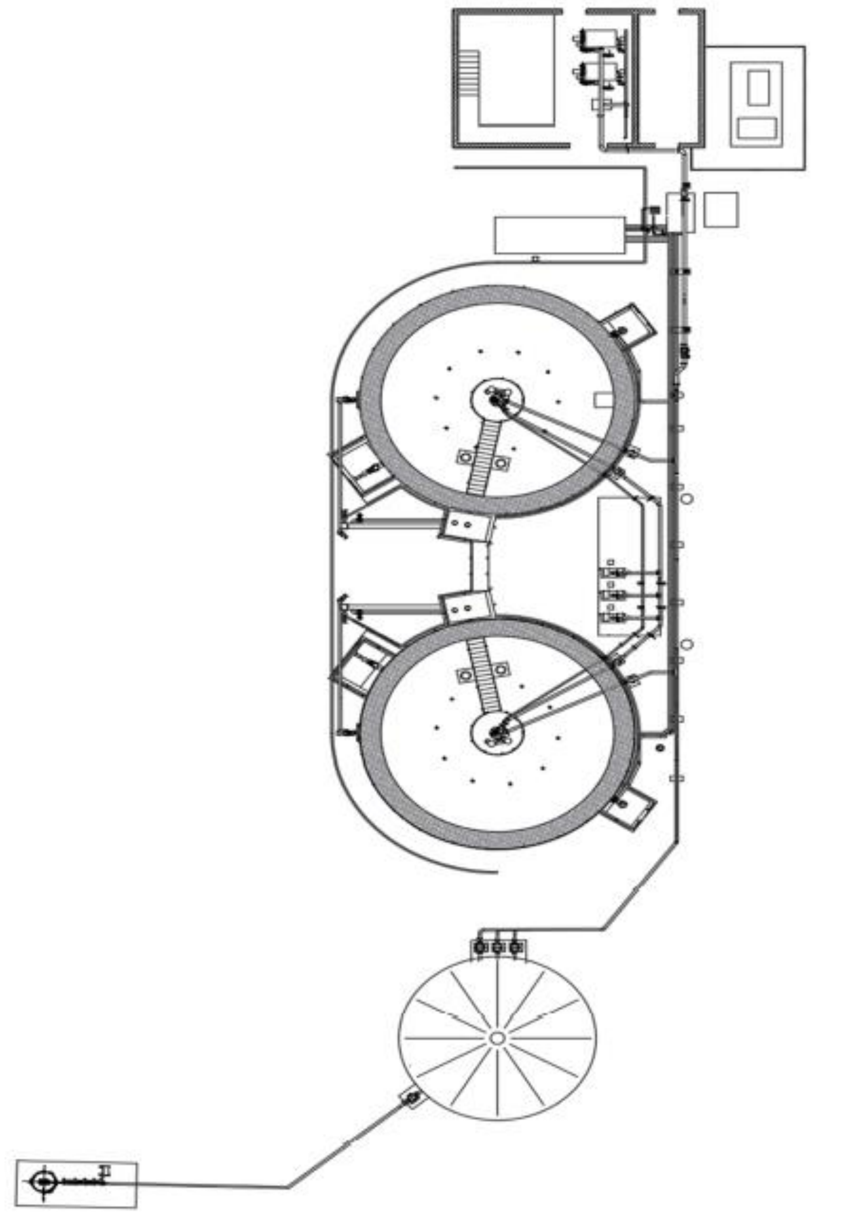
Dŵr Cymru Welsh Water

Queensferry WwTW
Digester Safety Instructions

PRINCIPLE BIOGAS

Emergency Instructions for Gas Leaks from Pipes and Equipment

Classify the Emergency			
Measure:	Slight	Moderate	Severe
	Personal gas monitor alarms. Bubbles in wet weather.	Personal gas monitor alarms at 0.5 ppm	Personal gas monitor alarms at 1 ppm or greater
Prepare			
Evacuate:	Area around leak – extend dependent on size of leak.		
Assess the risk:	Consider H_2S, asphyxiation and fire& explosion risk. Consider any source of ignition and control them.		
Communicate:			
Equipment:	PPE, gas monitor, leak detection fluid (LDF), adjustable spanners, torch.		
Contain			
Action:	Turn off associated equipment and close isolation valves.	Turn off nearby and associated equipment at control panel and close isolation.	Turn off nearby and associated equipment at control panel and close isolation valves. If leak is in or near boiler house evacuate immediately. Close the isolation valves on the gas holder.
Control			
Action:	Use LDF to investigate and repair if possible.	Set up exclusion area. Use LDF to investigate and repair if possible.	Set up exclusion area. Use LDF to investigate and repair if possible. No lone working.
Consolidate			
Action:	If cannot fix report to manager and consider downstream systems – if leak is on gas system, stop feeding until repaired.	If cannot fix report to manager and consider downstream systems – if leak is on gas system, stop feeding until repaired.	If cannot fix report to manager and consider downstream systems – if leak is on gas system, stop feeding until repaired.



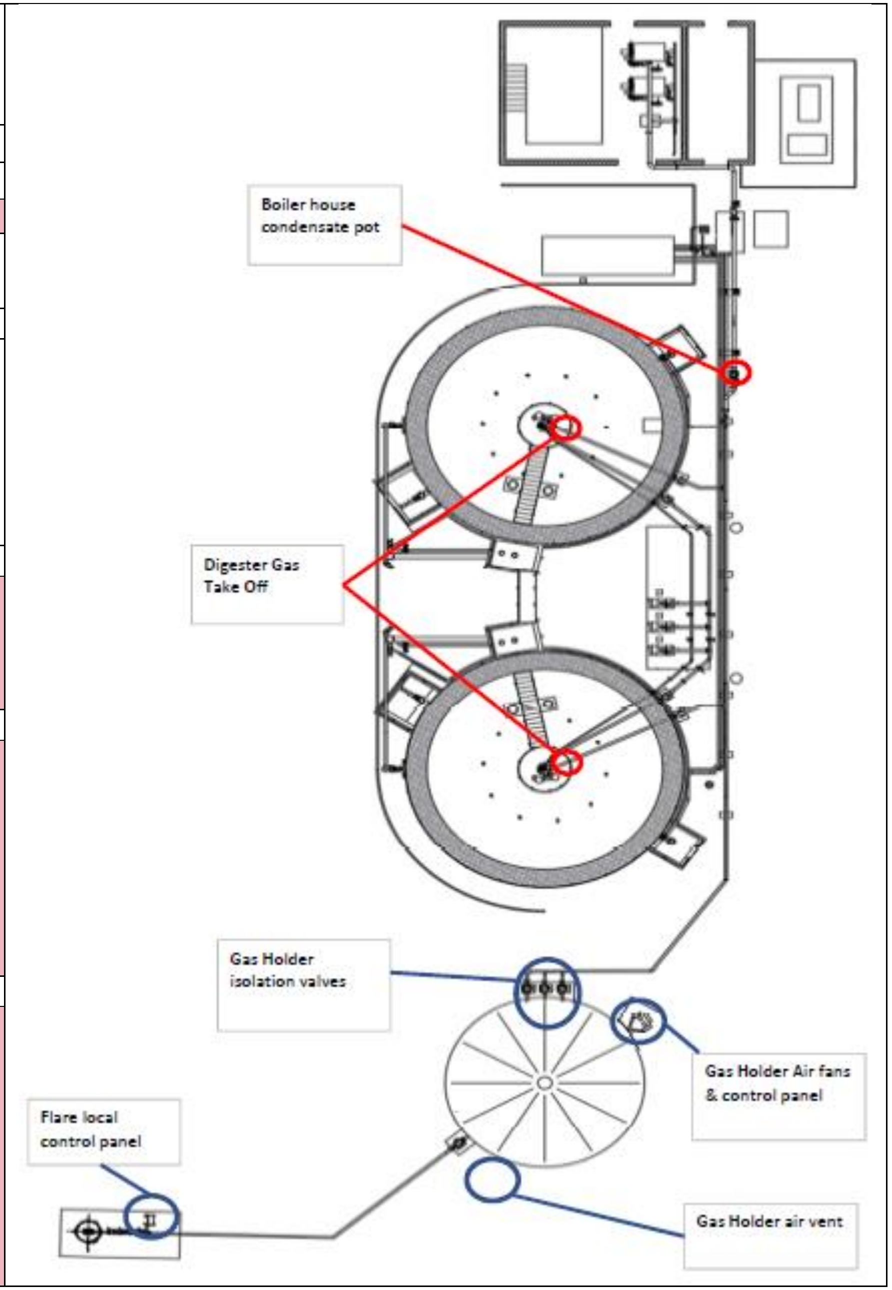
Dŵr Cymru Welsh Water

Queensferry WwTW
Digester Safety Instructions

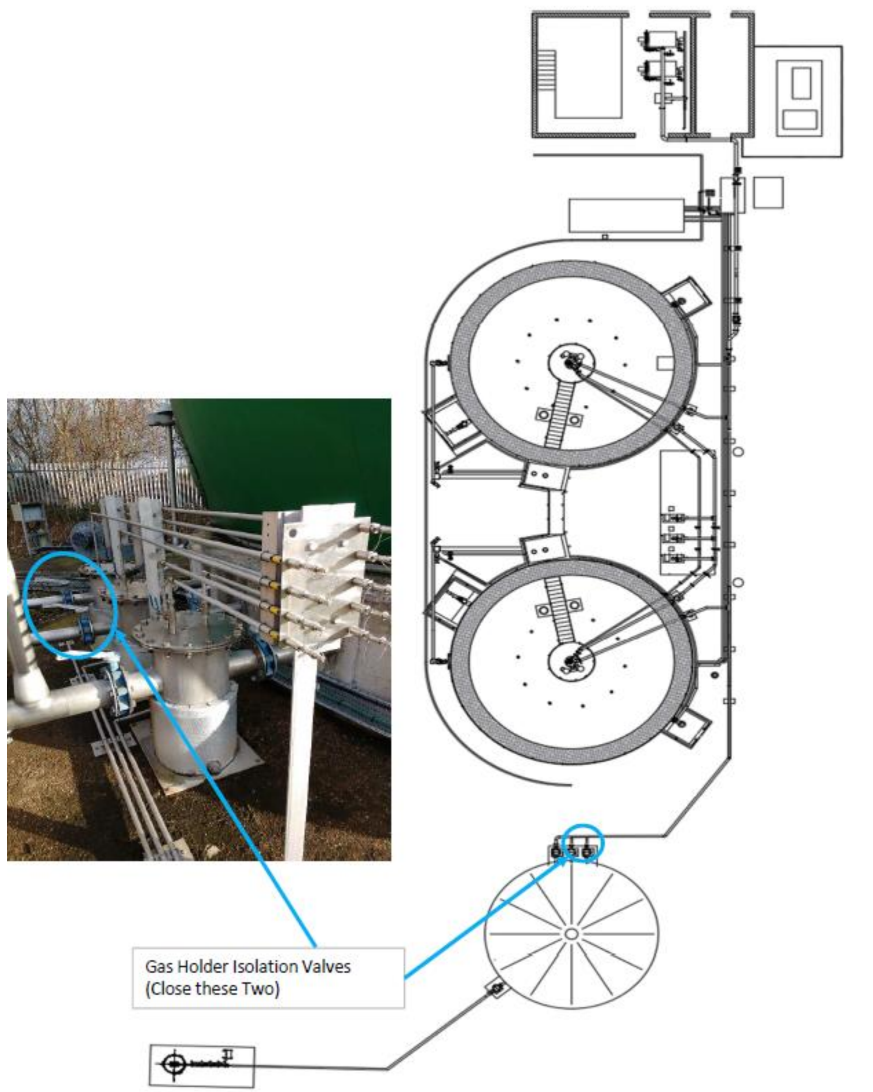
PRINCIPLE BIOGAS

Emergency Instructions for Gas Leak from Inner Membrane

Classify the Emergency			
Measure:	Slight	Moderate	Severe
	Methane detected at gas holder air vent: less than 2%	Methane detected at gas holder air vent: more than 2%	Methane detected at Gas holder air vent: More than 5%
Prepare			
Evacuate:	Gas holder area and digester roof		
Assess the risk:	How severe is the leak? (5% methane is lower flammability limit in air).		
Communicate:			
Equipment:	PPE, gas monitor, gas analyser and fittings, cones and barrier tape.		
Contain			
Action:	Isolate the gas holder. Fully open the air vent (next to flare take off). Turn on standby fan. Turn off CHP & boilers.	Isolate gas holder. Turn off CHP & boilers.	Isolate digester gas take offs and gas users at boiler house condensate pot.
Control			
Action:	Monitor methane in the air space of the gas holder. If it can be reduced: Adjust air vent so that working pressure (20mbar) is resumed in the gas system. Open gas holder isolation valves and resume operation. If persists treat as moderate.	Turn on the flare in hand at local panel.	Turn on the flare in hand at local panel. Set up exclusion zone around gas holder with authorised access only.
Consolidate			
Action:	Arrange gas holder inspection.	Arrange for repair ASAP. Stop feeding the digester and close to tanker imports.	Arrange for gas holder repair. Stop feeding the digester and close to tanker imports.



Dŵr Cymru Welsh Water	**Queensferry WwTW Digester Safety Instructions**
Emergency Instructions for Gas Leak in the Boiler House	
Classify the Emergency	
Measure:	Methane alarm activates in the boiler house
Prepare	
Evacuate:	Boiler room & CHP area immediately. Rest of site for non-essential personnel.
Assess the Risk:	
Communicate:	Contact CHP service provider to prevent any 'remote' restart attempts.
Equipment:	PPE, gas monitor, cones and barrier tape.
Contain	
Actions:	Isolate biogas consumer valves at gas holder. Ensure flare is in 'remote' at local panel to allow automatic control.
Advice:	
Control	
Actions:	Establish an exclusion area around boiler house, authorised access only. Allow gas within the boiler house to dissipate.
Advice:	
Consolidate	
Actions:	
Advice:	



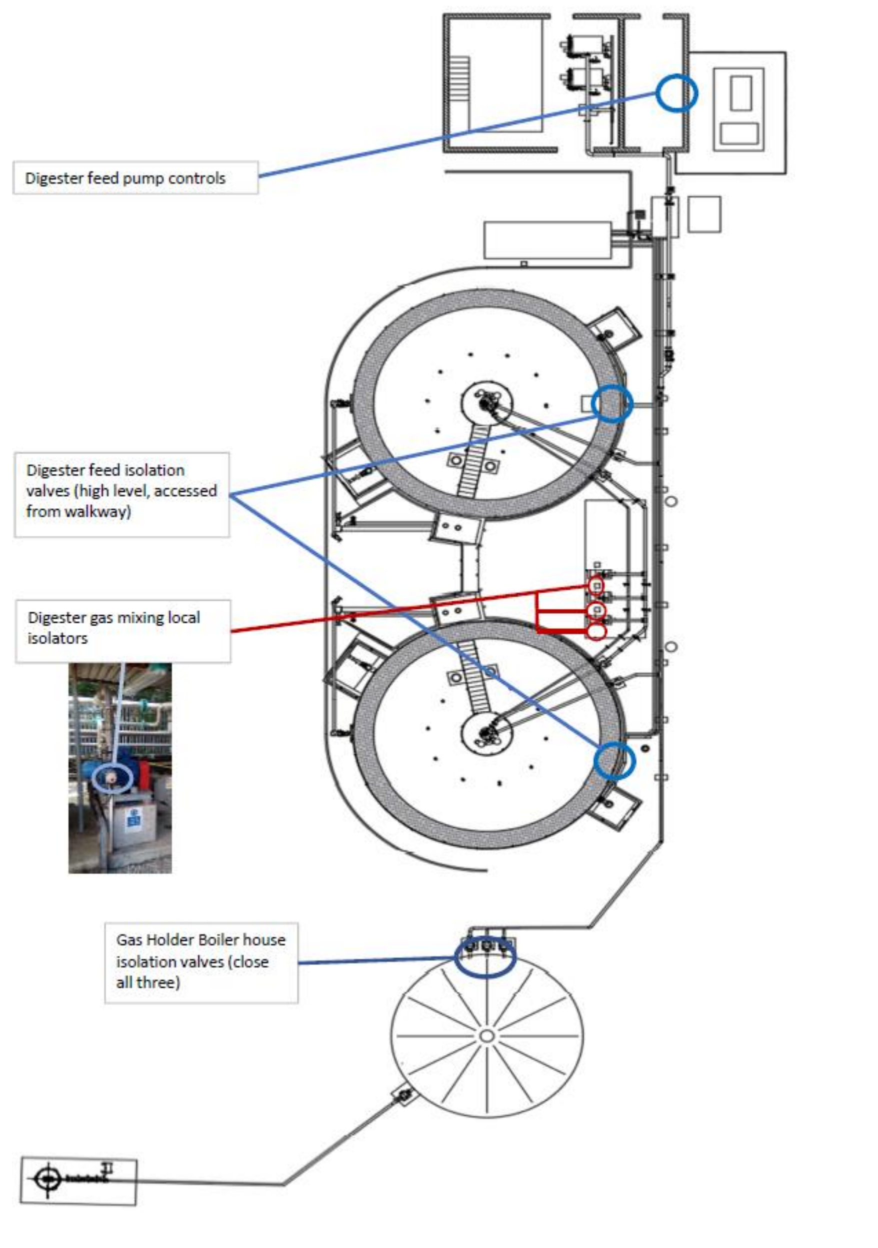
Dŵr Cymru Welsh Water

Queensferry WwTW
Digester Safety Instructions

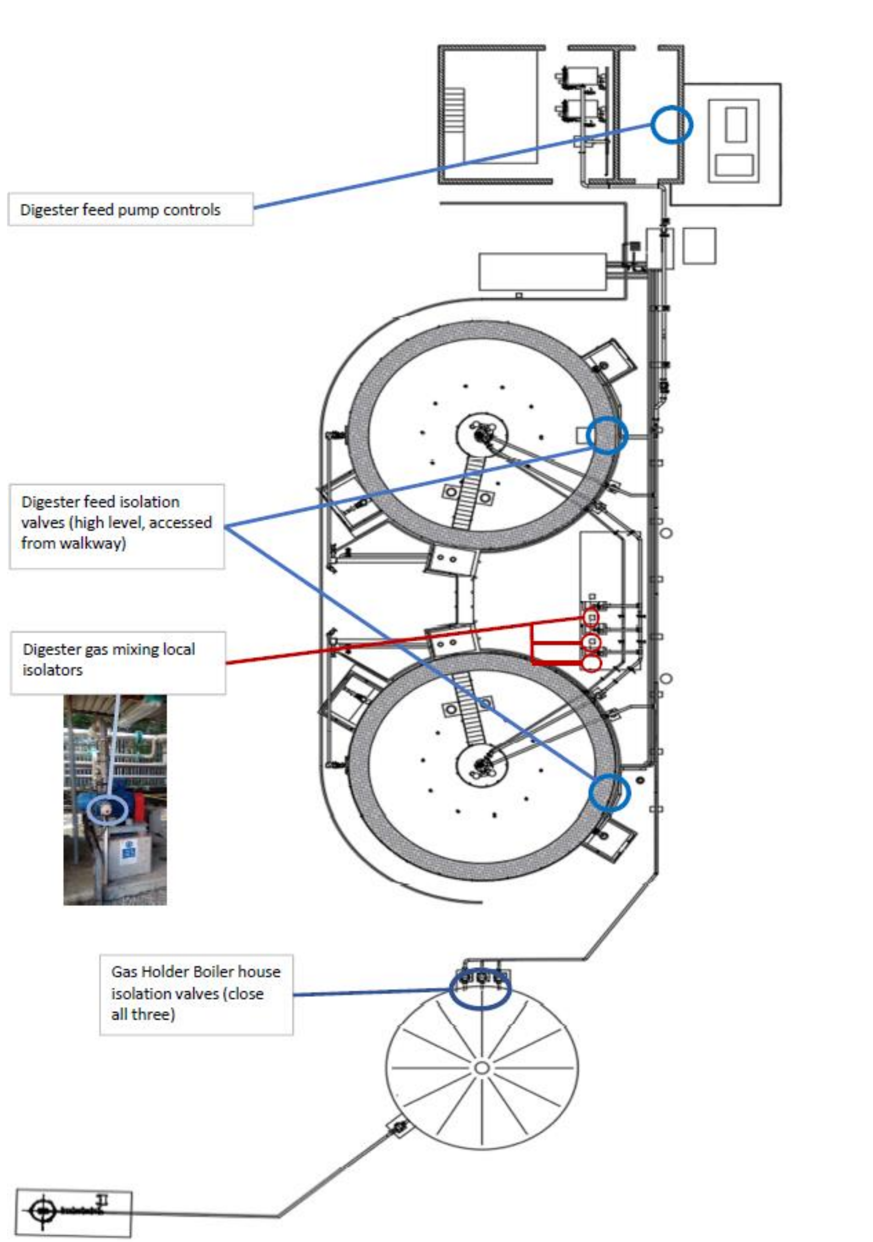
PRINCIPLE BIOGAS

Emergency Instructions for Feed Pipework Leaks

Classify the Emergency			
Measure	**Slight**	**Moderate**	**Severe**
	Leak at flange or equipment	Pipe rupture (above ground)	Pipe-rupture (inside pump room)/ Large scale release which cannot be readily/safely stopped.
Prepare			
Evacuate:	Vicinity of leak if slight/moderate. Pump room if severe.		
Assess the risk:	What level is the digester at? How quickly is this changing? Where is the sludge going? What happens if this leak is not stopped? How quickly will that happen? At 83% digester level, the high level overflow will begin to release gas.		
Communicate:	Inform site Supervisor/Bronze Manager.		
Equipment:	PPE, gas monitor, adjustable spanners, cones, barrier tape, spill kit, hoses.		
Contain			
Actions	Isolate associated valves & equipment (Feed Pumps) Use manual isolations as well as actuated valves. If necessary, clean up spillage to ease biogas (H_2S) release, particularly for leaks in the basement. If personal alarm sounds, evacuate and ventilate.	Turn digester feed pumps off. Close actuated valves. **If safe:** close digester feed valve. **If unsafe:** Turn gas mixing off for both digesters at local isolators. Close gas holder isolation valves. Treat digester headspace & roof as PEXA area.	Isolate power at drum thickener building. **If safe:** close digester feed valve. **If unsafe:** Turn gas mixing off for both digesters at local isolators. Close gas holder isolation valves. Treat digester headspace & roof as PEXA area.
Control			



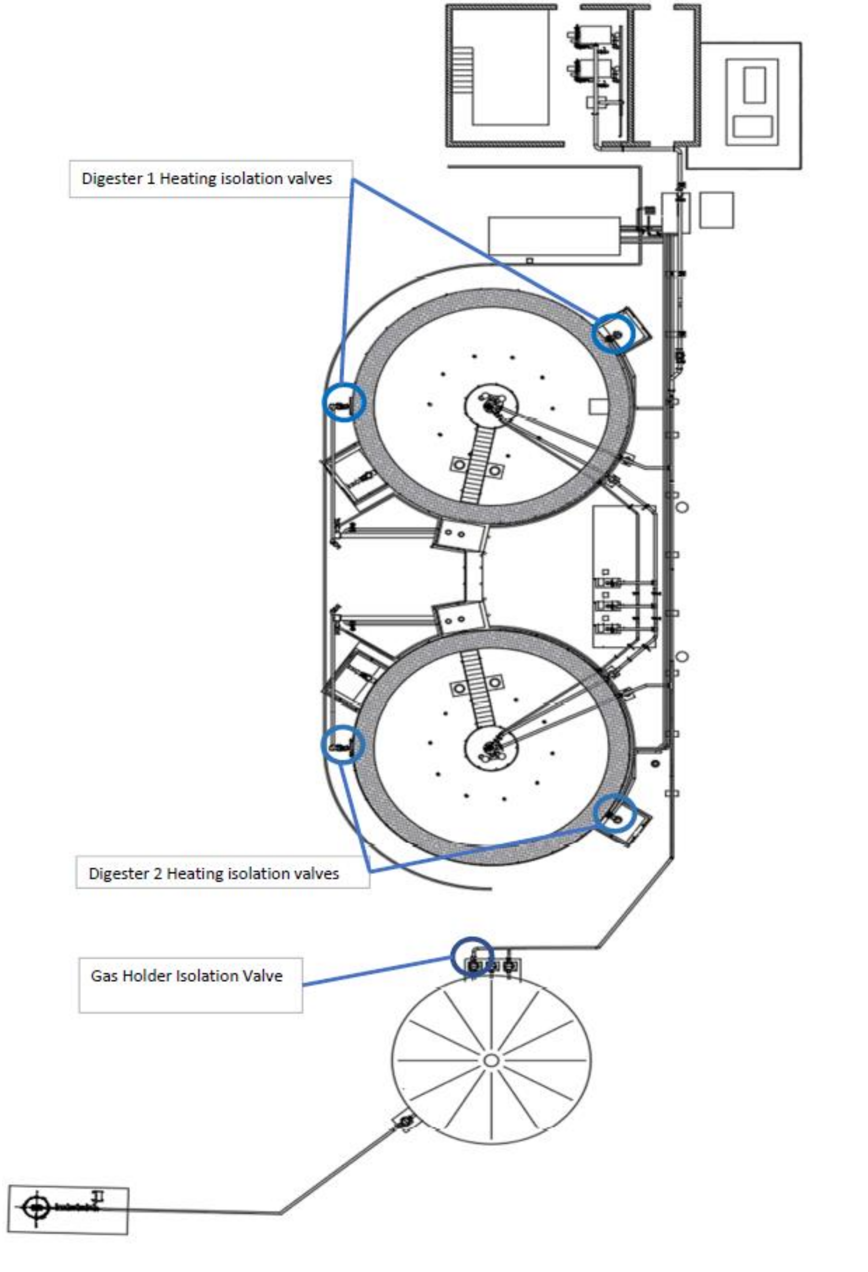
Actions:	Repair the leak using tools, equipment and methods which you are trained in the use of. If the repair is beyond what you can achieve, call for assistance. Cancel sludge imports.	Establish extent of spillage, prevent where possible. Cancel sludge imports.	Cellar will overflow by approximately 100m3 before feed pipe is above sludge level. Be prepared to contain this spillage or at least track its progress. Cancel sludge imports.
	Consolidate		
Actions:	Resume site normal operation- bring isolated systems back online. Call site manager to let them know site has returned to normal. Try and establish the cause of the leak, and check if there have been any secondary effects of the leak damaged panels etc	Call specialists for assistance with making repairs to damaged pipe. If gas seal has been lost get specialist support on site ASAP. Clean up spill. If possible return unaffected digester to service. Call site manager to discuss situation. Due to high level feed entry point, digester will not drain fully and flow of sludge will stop once it reaches approximately 80%.	Call site manager to discuss situation. Call specialist support for help in containing the spillage and making repairs to the digesters safely.



Dŵr Cymru Welsh Water	**Queensferry WwTW Digester Safety Instructions**	PRINCIPLE BIOGAS

Emergency instructions for Sludge Leaks on the Digester Heating

	Classify the Emergency		
Measure:	**Slight**	**Moderate**	**Severe**
	Leak at flange or equipment	Leak through pipe wall or pump casing	Sever pipe damage.
	Prepare		
Evacuate: **Assess the risk:** **Communicate:** **Equipment**:	Vicinity of leak What level is the digester at? How quickly is this changing? Where is the sludge going? What happens if this leak is not stopped? How quickly will that happen? At 83% digester level, the high-level overflow will begin to release gas. Line manager. If spillage cannot be contained on site, Natural Resources Wales MUST be informed. If heating cannot be quickly repaired, contact logistics and reduce imports by 50% per digester affected. PPE, gas monitor, adjustable spanners, cones, barrier tape, spill kits, portable pumps and hoses.		
	Contain		
Actions: **Advice:**	Isolate associated valves & equipment (Circulation Pump, Heat Exchanger). If necessary, clean up spillage to ease biogas release, particularly if leak is in delivery sump. Stop pump, then make valve isolations.	Stop the heat exchanger circulation pump at local isolator. Close Heating isolation valves at digester.	Stop the heat exchanger circulation pump at local isolator. Close Heating isolation valves at digestate. Turn of gas mixing.
	Control		
Action:	Repair the leak using tools, equipment and methods which you are trained in the use of. If the repair is beyond what	Confirm digester level at HMI. If it is less than 85%, restrict access to digester rooves and close gas holder isolation valves.	Confirm digester level at HMI. If it is less than 85%, restrict access to digester rooves and close gas holder isolation valve.

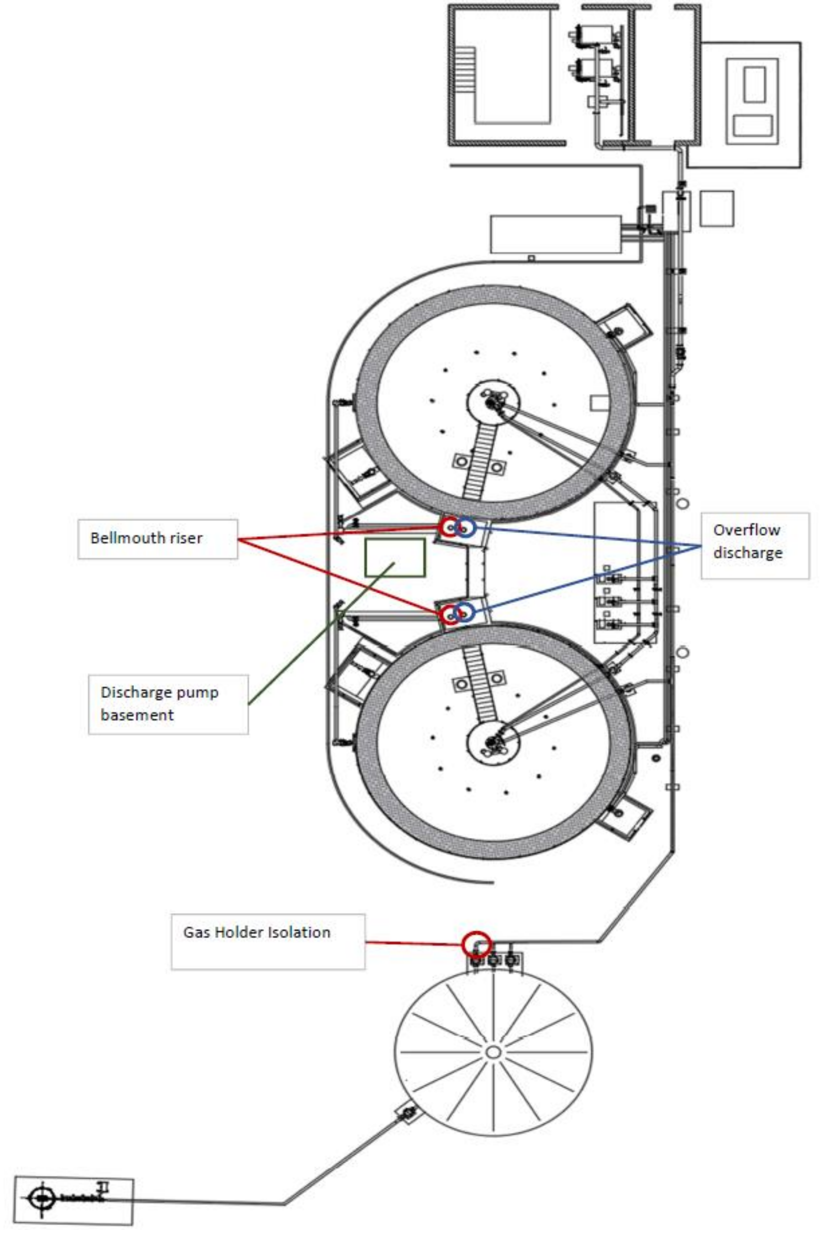


Advice:	you can achieve, call for assistance. Stop feeding digester while heat exchanger is offline. If heating is off for extended period, consult specialists for recommissioning advice.	Turn all gas mixing Off. Stop feeding the digester. Use sandbags & spill kits to contain spilt sludge. Set up dilution water supply and portable pumps as appropriate to control the leak route.	Stop feeding the digester. Cancel sludge imports. Use sandbags & spill kits to contain spilt sludge. Set up dilution water supply and portable pumps as appropriate to control the leak route.	
	Consolidate			
Actions: **Advice**:	Resume site normal operation- bring isolated systems back online. Call site manager to let them know site has returned to normal. Try and establish the cause of the leak, and check if there have been any secondary effects of the leak.	Call site manager. Call specialists for assistance with repair parts procurement/ fabrications. Begin clean-up operation. Cancel sludge imports. Consult specialists for recommissioning advice due to heating stoppage.	Call site manager. Call specialists for assistance with repair parts procurement/ fabrications. Begin clean-up operation. Cancel sludge imports. Consult specialists for recommissioning advice due to heating stoppage.	

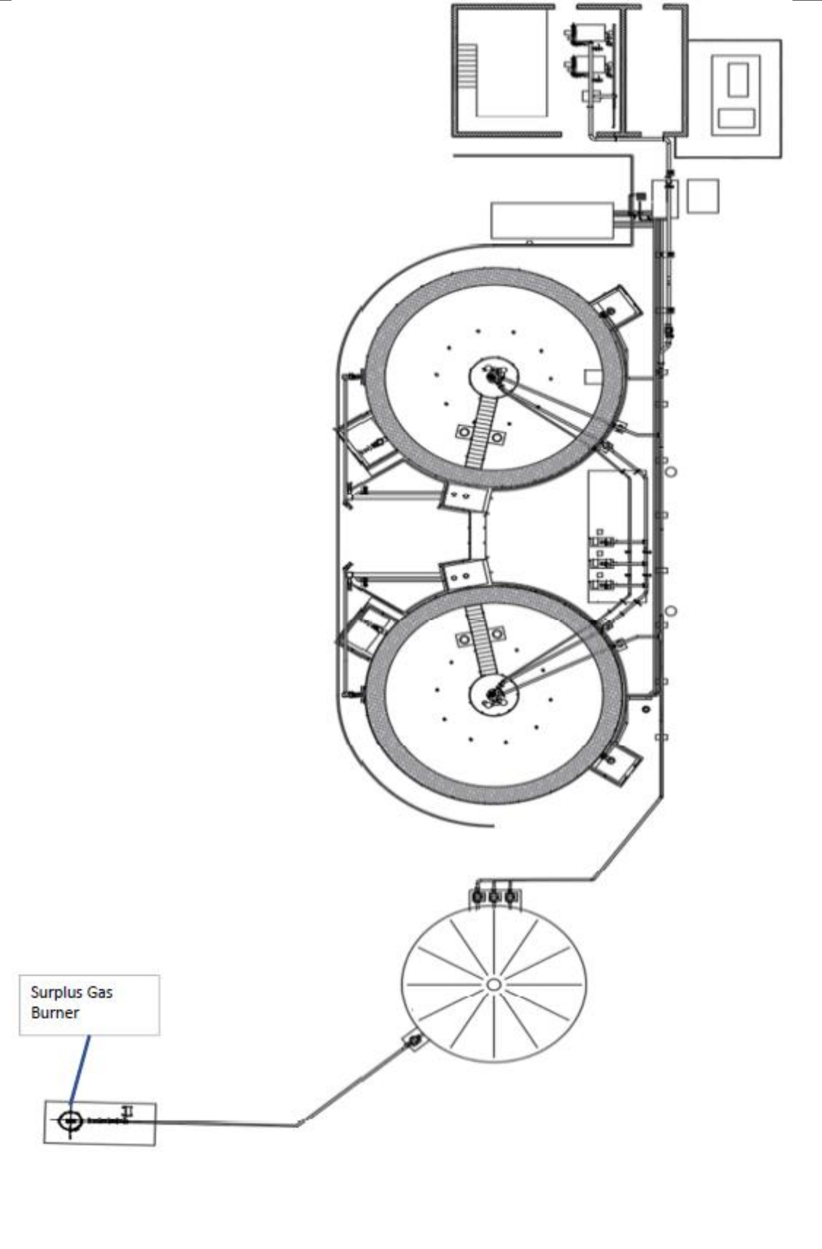
Dŵr Cymru Welsh Water	**Queensferry WwTW** **Digester Safety Instructions**	PRINCIPLE BIOGAS

Emergency Instructions for Digester Discharge Equipment Leaks

Classify the Emergency			
	Slight	**Moderate**	**Severe**
Measure:	Leak from overflow chamber discharge pipe. Digester low level.	Leak in underground discharge pipes/pumps. Digester low level.	Leak from riser connected to bellmouth. Digester low level.
Prepare			
Evacuate:	Area around & underneath overflow chambers. Ensure discharge basement is clear of people.		
Assess the Risk:	Is the cause of the leak visible? Has the overflow chamber/pipes moved? IF SO DO NOT ENTER PITS!		
Communicate:			
Equipment:	PPE, gas monitor, adjustable spanners, cones, barrier tape, spill kits, portable pumps & hoses.		
Contain			
Actions:	Stop feeding affected digester. If leak persists, stop feeding both digesters and ensure discharge line is running freely.	Stop feeding both digesters. Ensure digester discharge valves are closed (in pits) – only if safe to do so.	Stop feeding affected digester. Ensure digester discharge valves are closed (in pits) – only if safe to do so.
Control			
Actions:	Contain leak and clean up spillage.	Contain and clean spillage.	Contain and clean up spillage. Confirm digester level – if it is less than 85%, treat the digester roof area as containing an explosive atmosphere. Isolate the gas holder and turn off gas mixing.
Consolidate			
Actions:	Inform site manager. Reduce sludge imports. Arrange for specialist to assess/repair.	Inform site manager. Reduce sludge imports. Arrange for specialist to assess/repair.	
Advice:	Repairs may take significant time and appropriate plans will need to be put in place for the duration.		Repairs may take significant time and appropriate plans will need to be put in place for the duration.



Dŵr Cymru Welsh Water	**Queensferry WwTW** **Digester Safety Instructions**	PRINCIPLE BIOGAS
Emergency Instructions for Fire		
Classify the Emergency		
Measure	Boiler house/CHP built in alarm operational	Other: Fire visible Air horn activated.
Prepare		
Evacuate: **Assess the Risk:** **Communicate:** **Equipment:**	Entire digester area system. How large is the fire? What equipment is affected/likely to become affected? Call fire service and inform them of fire, stating it is a sewage works with gas fire and explosion risks on site.	
Contain		
Actions: Advice:	Observe Surplus Gas Burner. Report its operation to Bronze level supervisor. As part of general site awareness, invite local fire brigade to site so they are familiar with the site, risks and gas safety shutoff valve location	IF SAFE turn off affected and nearby equipment at the control panel. If possible, run flare in hand at local control panel. Turn off feeding, boilers and CHP
Control		
Actions:	Be prepared to assist fire service with site knowledge, specifically gas pipe routes and explanation of how the gas holder works. Establish exclusion zone around digester site, authorised personnel (fire service etc.) access only.	
Consolidate		



Dŵr Cymru Welsh Water

Queensferry WwTW
Digester Safety Instructions

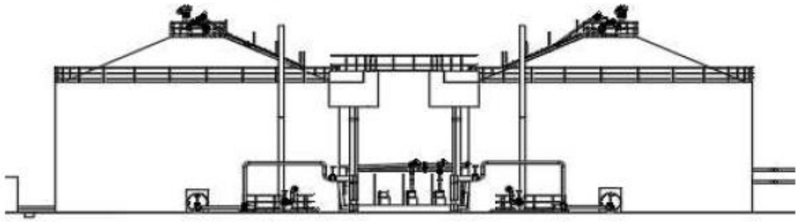
PRINCIPLE BIOGAS

Emergency Instructions for Digester Vessel Leaks

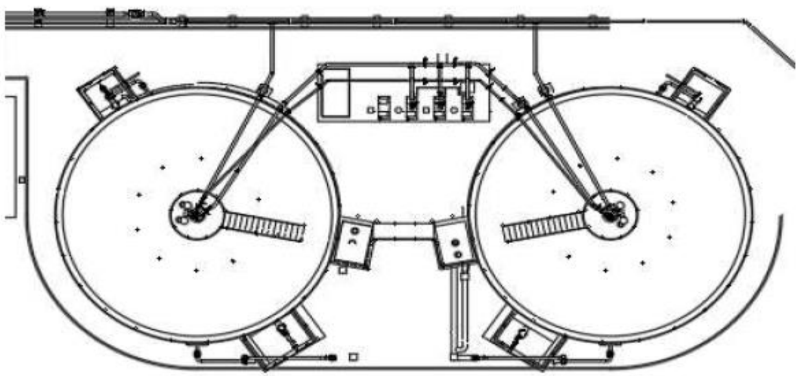
Classify the Emergency	
Measure	Any new leak permeating through the digester concrete or around a cast iron nozzle/door/fitting.
Prepare	
Evacuate:	Digester roof area.
Assess the risk:	Where is the leak? How big is it? Is the leak best described as a ‘drizzle’ or a ‘flow?’ If there has been an incident such as (but not exclusively) a vehicle strike or earth tremor, both digesters should be checked thoroughly.
Communicate:	
Equipment:	PPE, gas monitor, cones, barrier tape, spill kit, portable pumps & hoses.
Contain	
Actions:	Stop feeding the affected digester(s) Set up an exclusion zone around and beneath the leak location.
Control	
Action:	If safe and practicable, mark leak extent and monitor for expansion. If leak cannot be reached or approached, take photographs from a safe location.
Consolidate	
Action:	Call site manager and arrange for specialists to survey the digester for structural integrity.

Use the drawings below to show the leak location

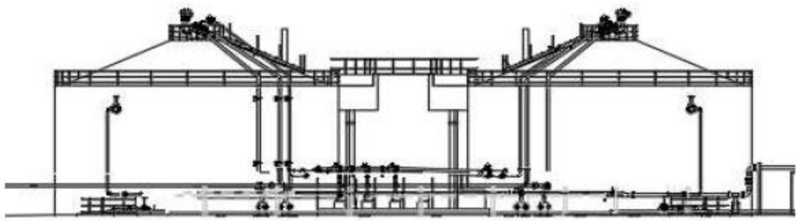
FRONT (ROAD SIDE) VIEW OF DIGESTERS



PLAN VIEW OF DIGESTERS



REAR (FENCE SIDE) VIEW OF DIGESTERS



Dŵr Cymru Welsh Water	**Queensferry WwTW Digester Safety Instructions**	PRINCIPLE BIOGAS

Incident Report Sheet

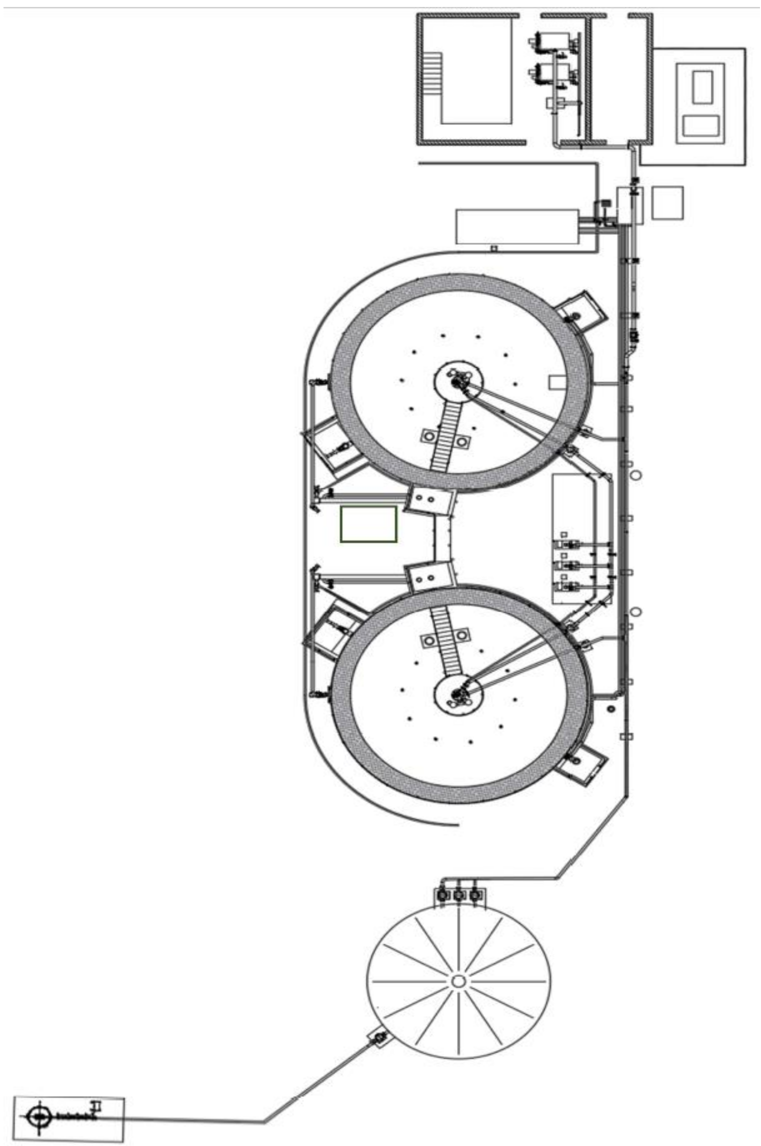
Post incident report sheet to facilitate handover.

Incident Details:

Actions Taken:

Current Site status:

Forward Planning:



Dŵr Cymru Welsh Water	Queensferry WwTW Digester Safety Instructions	PRINCIPLE BIOGAS

Emergency Actions Practice Register:

It is recommended that emergency actions are practiced for operational reliability and familiarity for staff.

Date	Situation Simulated	Issues Identified	Actions to resolve	For/When	Completed?

B. PEXA (DSEAR) Zoning

Queensferry WWTW

Potentially Explosive Atmospheres Plan

DŴR CYMRU WELSH WATER

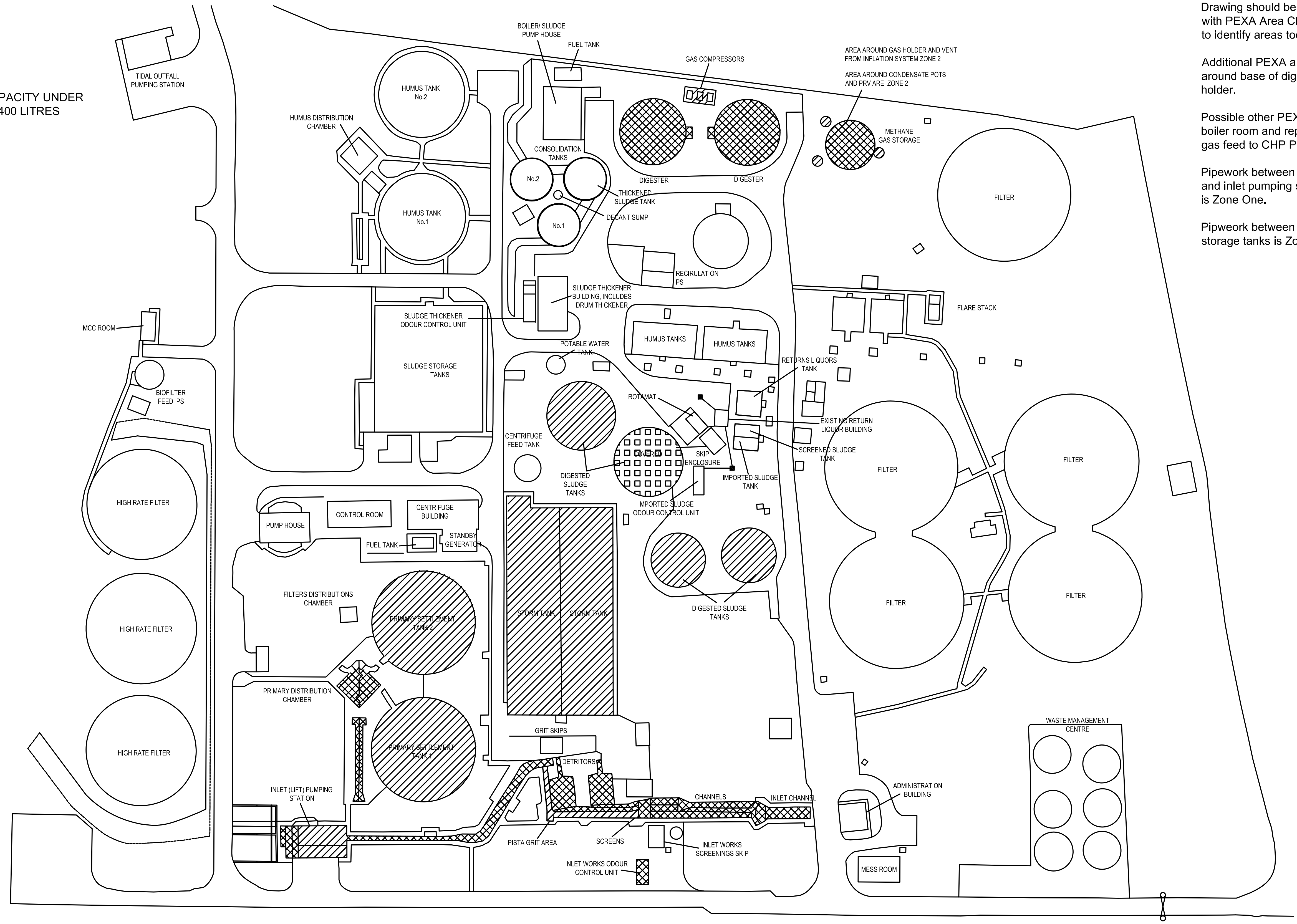
PEXA Plan

ZONE 0

ZONE 1

ZONE 2

MAXIMUM STORAGE CAPACITY UNDER PEXA REGULATIONS IS 400 LITRES



Notes:

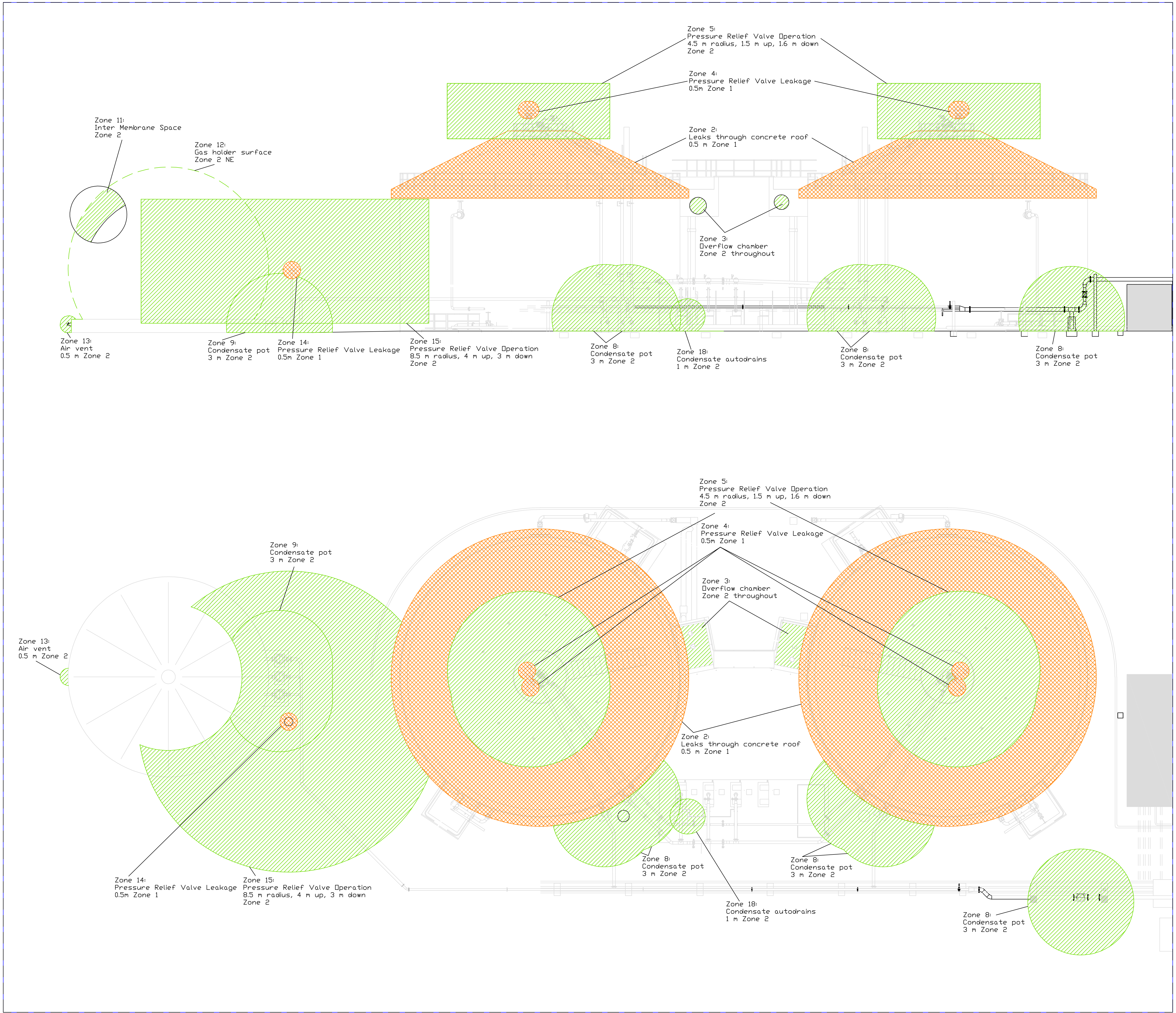
Drawing should be used in conjunction with PEXA Area Classification Table to identify areas too small to display.

Additional PEXA areas on roof of digesters, around base of digestor, around gas storage holder.

Possible other PEXA Zones in dry well under boiler room and replacement compressor for gas feed to CHP Plant.

Pipework between inlet works and storm tanks and inlet pumping station and primary tanks is Zone One.

Pipweork between digesters and digested sludge storage tanks is Zone One



Principle Biogas
Unit 4 Lower Barns Business Park
Ludlow Shropshire SY8 4DS
t:03332 079991 e: info@principlebiogas.co.uk

GENERAL NOTES

Zone 1:
An area in which an explosive atmosphere consisting of a mixture with air of gas, vapor or mist is likely to occur in normal operation occasionally.

Zone 2:
An area in which an explosive atmosphere consisting of a mixture with air of gas, vapor or mist is not likely to occur in normal operation but, if it does occur, will persist for a short period only.

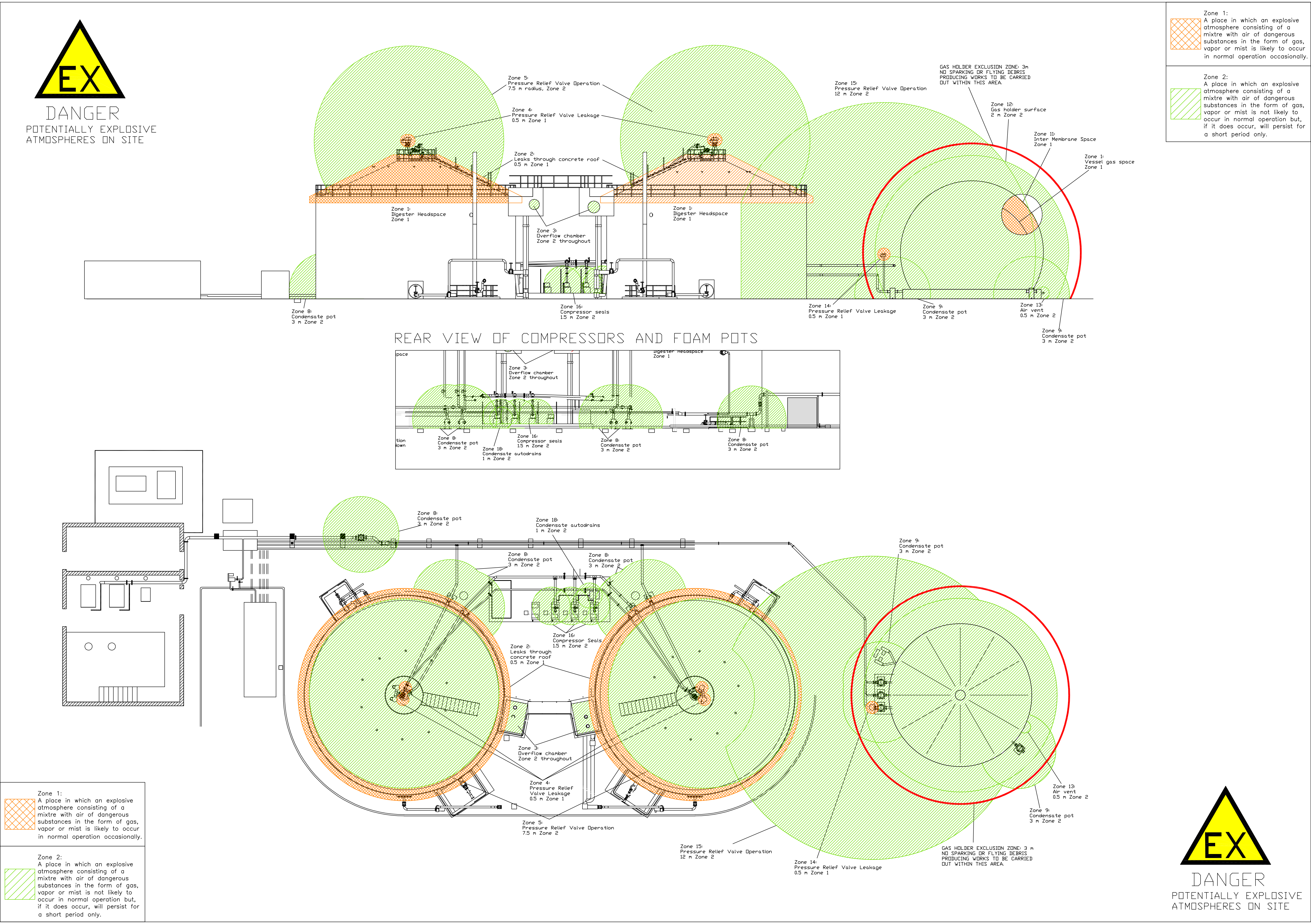
REV	DESCRIPTION	DATE

Title
ATEX ZONE EXTENTS

Project and Address

QUEENSFERRY WWTW
FACTORY ROAD
PENTRE
SANDYCROFT INDUSTRIAL ESTATE
FLINTSHIRE
CH5 2QJ

Drawing Number	Drawing Title
PB1056-531	Queensferry Anaerobic Digester ATEX (PEXA) Zone Classification
Drawn	Date
TG	18/05/18
Approved	Scale
KK	1:100



EX
DANGER
POTENTIALLY EXPLOSIVE ATMOSPHERES ON SITE
Zone 1: A place in which an explosive atmosphere consisting of a mixtre with air of dangerous substances in the form of gas, vapor or mist is likely to occur in normal operation occasionally.
Zone 2: A place in which an explosive atmosphere consisting of a mixtre with air of dangerous substances in the form of gas, vapor or mist is not likely to occur in normal operation but, if it does occur, will persist for a short period only.
Zone 5: Pressure Relief Valve Operation 7.5 m radius, Zone 2
Zone 4: Pressure Relief Valve Leakage 0.5 m Zone 1
Zone 2: Leaks through concrete roof 0.5 m Zone 1
Zone 1: Digester Headspace Zone 1
Zone 3: Overflow chamber Zone 2 throughout
Zone 15: Pressure Relief Valve Operation 12 m Zone 2
GAS HOLDER EXCLUSION ZONE: 3m NO SPARKING OR FLYING DEBRIS PRODUCING WORKS TO BE CARRIED OUT WITHIN THIS AREA.
Zone 12: Gas holder surface 2 m Zone 2
Zone 11: Inter Membrane Space Zone 1
Zone 1: Vessel gas space Zone 1
Zone 8: Condensate pot 3 m Zone 2
Zone 16: Compressor seals 1.5 m Zone 2
Zone 14: Pressure Relief Valve Leakage 0.5 m Zone 1
Zone 9: Condensate pot 3 m Zone 2
Zone 13: Air vent 0.5 m Zone 2
REAR VIEW OF COMPRESSORS AND FOAM POTS
Zone 18: Condensate autodrains 1 m Zone 2
Zone 16: Compressor Seals 1.5 m Zone 2
Zone 4: Pressure Relief Valve Leakage 0.5 m Zone 1
Zone 5: Pressure Relief Valve Operation 7.5 m Zone 2
Zone 15: Pressure Relief Valve Operation 12 m Zone 2
GAS HOLDER EXCLUSION ZONE: 3 m NO SPARKING OR FLYING DEBRIS PRODUCING WORKS TO BE CARRIED OUT WITHIN THIS AREA.

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