MOTT MACDONALD

Queensferry Sludge Treatment Centre

Accident Management Plan

October 2024

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Queensferry Sludge Treatment Centre

Accident Management Plan

October 2024

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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.

The AMP and the procedures in the Appendices are live documents and subject to regular review (at least annually or more frequently should an incident occur).

1.2 Environmental Management System

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 STC, 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, dated 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 operation, 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 regarding 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 Roles and Responsibility

The Site Manager has overall responsibility for reviewing the processes on the Site to minimise the risk of accidents and reduce the impact of any accidents should they occur. This document is reviewed annually, but the review process is ongoing as part of the regular performance monitoring for the Site In the case of an emergency, key contacts and communication details are listed in Table 1.1.

Table 1.1: Key contacts and communication in the case of an emergency

Contact	Office Hours	Out of Hours
Dŵr Cymru Welsh Water (DCWW)	0800 052 0130 (Water emergencies) 0800 085 3968 (Sewer flooding & sewerage emergencies)	0800 052 0130 (Water emergencies) 0800 085 3968 (Sewer flooding & sewerage emergencies)
Natural Resources Wales (NRW)	0300 065 3000 (24 hours)	0300 065 3000 (24 hours)

Contact	Office Hours	Out of Hours
Emergency Services	999	999
Local Police	999	999
Local Hospital	Countess of Chester Hospital Countess of Chester Health Park Liverpool Road CH2 1UL 01244 365000	999
Local Authority Emergency Planning Services	Regional Emergency Planning Service North Wales Councils Flintshire County Council 01352 702121 www.flintshire.gov.uk/en/Business/Emergency-Planning/How-Flintshire-responds-to-an-emergency.aspx	Regional Emergency Planning Service North Wales Councils 01352 702121
Borough Council	Flintshire County Council 01352 702121	0345 0533116 (Social service) 01267 224911 (Housing, property or street scene service)
Water and Sewerage Provider	Dwr Cyrmu (Welsh Water) 0800 520 145	Water emergencies – 0800 052 0130 Sewer flooding and sewerage emergencies – 08000 853 968
Electricity Network Operator	Scottish Power Energy Networks 0800 001 5400 105 (power cut)	Scottish Power Energy Networks 0800 001 5400 105 (power cut)
Gas Network Operator	Wales and West Utilities 0800 912 2999	Wales and West Utilities 0800 111 999
Framework Waste Contractor	Biffa Waste Management 0800 307307 Geneco (screenings and grit only) 01225 524560	Biffa Waste Management 0800 307307 Geneco (screenings and grit only) 01225 524560
Specialist Spill Clean Up Contractor	Geo Pollution Technologies 01656 741 799	01656 741 799

1.4 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. Queensferry STC is in close proximity to the junction of the A494 and B5129. The Site is bordered by commercial and industrial premises to the east, south and west, a railway line to the south and waste land and a traveller's park to the north. The closest residential properties are located to the north, to the west across the A494, to the north along the A494 on the other side of the River Dee, and to the south across the B5129

The final effluent from the treatment works is discharged into the River Dee to the west.

Site address: Queensferry WWTW, Factory Road, Pentre, Deeside, CH5 2QJ

NGR: (SJ 32380, 68530).

The location of the STC is shown in Figure 1.1**.**

Figure 1.1: Queensferry STC Site Location

Emissions Ref	Emissions Points	Assets Ref	Assets	Type	X	Y
				Emission point	332335	368300
S01	Condensate Line Drain			Emission point	332346	368294
A01	Methane Gas Flare Stack	1	Methane Flare Stack	Emission point	332375	368230
A02	Boiler Stack 1&2	2	Dual Fuel Boiler 1&2	Emission point	332334	368301
A03	Boiler Stack 3	3	Gas Oil Boiler 3	Emission point	332337	368299
A04	CHP Plant Stack	4	CHP Plant	Emission point	332339	368291
A05	Pressure Relief Valve 1	5	Anaerobic Digester (AD) No. 1	Emission point	332351	368280
A06	Pressure Relief Valve 2	6	Anaerobic Digester (AD) No. 2	Emission point	332371	368266
		7	Gas Bag Holder	Installation point	332388	368250
A07	Gas Bag Pressure Relief Valve	7	Gas Bag Holder (Valve)	Emission point	332383	368257
A08	Standby Generator Exhaust Stack	8	Standby Generator	Emission point	332254	368226
A09	OCU 1	9	Odour Control Unit 1	Emission point	332311	368206
A10	OCU 2	10	Odour Control Unit 2	Emission point	332299	368263
		11	Gas Oil Fuel Tank	Installation point	332338	368304
		12	Boiler Building	Installation point	332332	368295
		13	Sludge Holding Tank 2 (Consolidation Tank)	Installation point	332317	368288
		14	Sludge Holding Tank 1 (Consolidation Tank)	Installation point	332316	368275
		15	Digester Feed Tank	Installation point	332328	368280
		16	Returned Liquors Tank	Installation point	332331	368213
		17	Screened Sludge Tank	Installation point	332328	368207
		18	Imported Sludge Tank	Installation point	332325	368203
		19	Digested Sludge Tank 1 (Zone 1)	Installation point	332311	368182
		20	Digested Sludge Tank 2 (Zone 1)	Installation point	332296	368190
		21	Digested Sludge Holding Tank 3 (Zone 2)	Installation point	332305	368213
		22	Screenings Skip	Installation point	332317	368210
		23	Rotamat (Screen)	Installation point	332316	368214
		24	Digested Sludge Holding Tank 4 (Zone 3)	Installation point	332297	368232
		25	Centrifuge Feed Tank	Installation point	332281	368234
		26	Centrifuge Building	Installation point	332256	368231
		27	Diesel Fuel Tank	Installation point	332245	368229
		28	Cake Bays x 3	Installation point	332243	368267
		29	Digested Sludge Holding Tank 6&7 (Zone 5)	Installation point	332270	368264
		30	Digested Sludge Holding Tank 5 (Zone 4)	Installation point	332278	368259
		31	Sludge Thickener Building	Installation point	332308	368260
M01	Centrate Returns Monitoring Point	32	Centrate Returns Well	Sampling point	332261	368246
M02	Thickener Returns Monitoring Point	33	Thickener Returns Well	Sampling point	332306	368240
M03	AD 1 Condensate Monitoring	34	AD 1 Condensate Trap	Sampling point	332357	368288
M04	AD 2 Condensate Monitoring	35	AD 2 Condensate Trap	Sampling point	332375	368275
M05	Gas Bag Condensate Trap	36	Gas Bag Condensate Trap	Sampling point	332382	368262

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 (for context only)

Preliminary treatment consists of two Escalator screens and associated de-waterer compactor and grit plant. 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 one of five digested sludge holding tanks. These vary in size but hold a total storage volume of approximately 7,300m^3. The treated sludge is then pumped to one 159m^3 open glass fused steel centrifuge feed tank and then dewatered via a single centrifuge with the aid of polymer to increase the percentage dry solids to between 20 and 25%. The dewatered 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 (CHP) unit for electricity generation, which supplies the digestion plant and for recovering heat, to maintain digester temperature. The site has two dual fuel (biogas and gas oil) and one gas oil boiler, which provides hot water for the digestion process. Any excess biogas is flared off via the on site waste biogas burner (flare stack).

Refer to B16383-123532-XX-XX-DR-ZA-DH0115 - QUY - Block Flow Diagram for a schematic of the sludge treatment process and B16383-123532-XX-XX-DR-ZA-DH0116 QUY - Site Layout Plan (Emissions), for location of the sludge treatment assets.

The IED permit includes the following assets:

- 3 No. Cake storage bays (70m^3 each)

- 3 No. Digested sludge holding tanks (3 lanes) (950m^3 each) (Zones 4 & 5)
- 1 No. Drum thickener, housed in thickener building
- 2 No. Screened sludge holding tanks (243m^3 each)
- 1 No. Digester feed tank (243 m^3)
- 1 No. Digester feed pumps
- 2 No. Digesters (1705 m^3 each)
- 1 No. Biogas flare
- 1 No. Sludge reception tank (164m^3), connected to a sludge transfer pumping station and rotomat (screen)
- 2 No. Digested sludge storage tanks (1720m^3 &1806m^3) (concrete) (Zones 2 (enclosed) & 3)
- 2 No. Digested sludge tanks (GFS) (468m^3 each) (Zone 1)
- 1 No. Centrifuge feed tank (159m^3)
- 1 No. Standby diesel generator
- 1 No. Centrifuge, located in centrifuge building
- 1 No. Gas bag holder
- 1 No. Liquor returns storage tank (aka. supernatant tank) which is connected to a liquor return pumping station
- 1 No. CHP unit (0.545MWth)
- 3 No. Boilers (0.39MWth) (2 No. dual fuel (biogas and gas oil) and 1 No. gas oil only)

The following are outputs from the process:

- Cake (dewatered post digestion sludge) ‑ exported to Five fords for AAD treatment
- Bio-gas - stored in an existing gas holder, and is then either:
  - Burnt in CHPs, with the power exported to the grid;
  - Flared in the waste biogas burner.
- Grit and screenings (small amount) ‑ deposited in skips before taken off-site.

The CHP engine at Queensferry was replaced in August 2024, by a CHP from DCWW's Kinmel site, and refurbished.

The CHP is powered by biogas and has a thermal rated input of 0.545MWth. Therefore, the Site falls outside the scope of the Medium Combustion Plant Directive (MCPD) since the thermal rated input is less than 1MWth thermal rated input. It is also, not subject to the specified generator rules as it is not used for standby operation. The CHP total annual operating hours is 8,500, allowing for routine maintenance. – This is due to be brought fully online by December 2024.

There are two dual fuel boilers (gas oil/biogas) both running continuously. In addition, there is one gas oil only boiler, that is only run for planned shutdown or failure of the dual fuel boilers. 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.

There is no scrubbing system on the biogas at Queensferry. The engine (or boilers if they are chosen to operate on biogas) will combust biogas as long as the methane content is ~50% or greater. This is achieved under normal operation for mesophilic anaerobic digestion.

With respect to any other substances, Hydrogen Sulphide and Siloxanes may be present in the gas, maybe on quantities that would cause increased wear, the biogas has never been routinely sampled for these at Queensferry as it is such a small engine DCWW has always chosen to operate without the additional costs and maintenance of the clean-up equipment, operational

experience from the CHP's historic operations is that there has not been significant impact to its performance from the biogas.

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
- All staff on site receive training in site emergency procedures as listed in Appendix A, 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.

A Leak Detection and Repair (LDAR) plan is in place at the Queensferry STC and is provided as document reference B16383-123532-XX-XX-PR-ZA-DH0123 - QUY LDAR.

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. The secondary containment, for sludge containing assets

has been designed according to CIRIA C736 guidance as a requirement to comply with BAT19(d).

- 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.
- All staff on site must receive training in site emergency procedures (Appendix A) 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. COSHH Data Sheets are provided in Appendix **Error! Reference source not found.** for all raw materials stored on site.

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. Materials 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.

Details of the raw materials and process chemicals held on site and their storage arrangements are provided in Table 3.1 below.

Table 3.1: Raw materials, volume and storage arrangements

Description of raw material and composition	Maximum amount stored	Annual throughput	Description of the use of the raw material	Storage
Diesel in two tanks Tank 1 Tank 2	33,000litres 20,000litres 13,000litres	10,475 litres 4,000litres 6,475litres	Used in generators and boilers during emergencies, however it is a rare occurrence. Ordered on an ad hoc basis.	Bunded tank (secondary containment)
Poly (Cationic Polyacrylamides)	1.5 tonnes 2,000 litres	Powder 12 tonnes Liquid 8,000 litres	Used as flocculant to enhance thickening and dewatering processes. Amount ordered depends on centrifuge use.	Power in 750kg bags on pallets, in enclosed building Liquid in IBCs on bunded trays, in enclosed building
Rock salt/grit	750 kg	750 kg	Used on icy roads to prevent slipping	750kg bags within enclosed building
Lubricant oils	400litres	400litres	For lubrication of CHP engines and other machiner.	205l drums on bunded trays, in enclosed building

3.1.4 Odorous Emissions

The Site currently does not have any operational odour control units (OCUs). However, works are underway as part of the Queensferry IED Odour Control Scheme to install new OCU's, to replace the current non-functioning OCUs, to comply with the IED and BAT requirements.

The provision of new odour control treatment system - AWT Dry (Peacemaker chlorinated shale) system (similar to the existing odour unit on site as part of the wastewater treatment) at the works to treat combined extracted odorous airflow from the following locations:

- Sludge import tank
- Liquor return storage tank
- Imported sludge screen and screening skip
- Thickener building including direct extraction from existing drum thickener
- Indigenous sludge storage tanks no's.1 and 2
- Digestor feed sludge storage tank

In addition, as part of this scheme, DCWW will make odour cover improvements on the following assets:

- Sludge import tank
- Liquor return storage tank
- Indigenous sludge storage tanks no's.1 and 2
- Digestor feed sludge storage tank
- New enclosure on imported sludge screening skip

Sludge treatment processes mostly happen in covered environments, with exception of the digested sludge holding tanks in Zones 1, 3, 4 & 5), minimising the likelihood for uncontrolled odour or bio-aerosol release. While cake storage bays are uncovered, the sludge at this stage does not require further treatment and has minimal bio-aerosol content.

Additional works are underway for odour cover improvements to replace existing covers that are in poor condition. There is no plans to cover the digested sludge tanks in Zones 1, 3, 4 & 5. The decision behind this is that the Site is due to be decommissioned before the end of AMP 8, although a date is yet to be confirmed,

Further details on the OCU operation is outlined in document reference: B16383-123532-XX-XX-PR-ZA-DH0129 – QUY-Odour Management Plan.

Regular inspection of site storage facilities and pipework is undertaken to ensure that the structural integrity of the system remains intact in line with the Queensferry STC LDAR plan and Odour Management Plan (OMP).

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, Arson 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
- 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:

- On arrival at site, visitors must sign the visitor's book located in the control room.
- An intruder alarm is activated/deactivated by keypad entry is operational in all major buildings covering:
  - the Control Building (Main Panel Room)
  - Boiler House and Control Room
  - Thickener and Centrifuge buildings
- 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.
- Storage vessels and pipework are subject to regular inspection, by the site team to ensure the structural integrity of the system remains uncompromised.
- Construction of a secondary containment bund, to 110% of the volume of the largest tank, to prevent the escape of sludge from the site during the unlikely event of a catastrophic tank failure.

3.1.7 Overfilling of tanks

Details of the raw materials and process chemicals held on site and their storage arrangements are provided in Table 3.1, Section 3.1.3 above. 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. Appropriate training is provided to personnel involved in receipt and handling of deliveries and specific procedures for the filling of tanks will be developed within the quality and environmental management system (QEMS) for the Site.

The volume of material in the receiving tanks will be measured and recorded manually prior to filling.

In the event of a spillage of polluting substances, the Site's spillage procedure will be followed (Appendix A). Absorbent material contained within the spill kits provided on site, will be used to clear the spillage. Relevant management will be informed of the incident as soon as possible. The management informed of the spillage will be responsible for notifying the relevant authority (NRW or the HSE), if required. The used materials will be removed and stored in suitable containers prior to authorised disposal to a licenced waste management facility.

The Installation will incorporate impermeable paving with self-contained drainage.

3.1.8 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
- Loss of containment of contaminated firewater

Fire extinguishers are placed, in appropriate location across 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.

A Fire Prevention Plan is not required for the Site, as the biowaste process on site is wet anaerobic digestion. However, fire prevention and environmental fire risk assessment

procedures are provided in the EMS and H&S manual. Emergency procedures for fire or smoke on any part of the plant are included in Appendix A.

3.2 Contingency plan during clean up

The DCWW emergency plan covers various scenarios relating to both gas and sludge release.

This contingency plan would not be used in isolation, but in conjunction with DCWW company-wide emergency planning procedures, incorporating our Bronze, Silver and Gold emergency response procedures which are in place for medium and major disaster recovery situations. It sets out how DCWW would plan, maintain and respond to a major release of sludge from a digester.

Once the containment area is constructed, it will be possible, in the unlikely event of a catastrophic failure of a digester, to contain any sludge and either retreat through our existing de-watering equipment and or use tankers to remove sludge from site to our other AAD facilities.

The timeframe for clean-up is highly dependent on many factors, such as how much has been released and as mentioned above how much we can re-treat through our existing equipment. The containment report allows for 3-4days to clear the sludge and clean the Site after a total failure scenario and this is considered achievable by DCWW. The Site is manned and monitored 24/7/365, therefore, in the event of any incident occurring on site, DCWW would be able to respond, assess and manage the incident in a timely manner.

The biological treatment process will remain protected by isolating the return liquor pumping station as outlined in the emergency plan. Surplusing of activated sludge will be suspended until the pumping station can be recommissioned or alternative arrangements put in place, such as tankers to support the removal of sludge and/or firefighting water.

Ongoing monitoring of the digester condition will continue with the undertaking of two-yearly thermal imaging drone technology, which has been very successful and accurate. Daily visual inspections are undertaken by staff as part of their daily checks and digester performance data is produced daily, which is reviewed and monitored by staff and Marches Biogas who are experts in digester health and performance. Therefore, DCWW are confident that there are robust management checks in place to prevent and identify any potential short- or long-term issues, which could lead to any failure of the assets.

3.3 Post-incident 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.

4 Risk Assessment Methodology

The risk assessment has been undertaken by identifying hazards and source-pathway receptors and assigning a probability of exposure and a severity of consequence. These are assigned as described in Table 4.1 and Table 4.2 and are based on the generic risk assessment used for standard rules "SR2008 No19[1]", applicable to anaerobic digestion operations including use of the resultant biogas.

The probability and severity scores are then combined within a matrix to give an overall magnitude of the risk. This matrix is shown in Table 4.3 and is intended to illustrate the general approach to scoring.

Risks are categorised as either low, medium or high; this ranges from being a nuisance in some instances to potential health risks in others.

Table 4.1: Severity Index

Severity of harm	Severity index
Impact to people or designated receptor	
Impact to non-designated receptor	
All other impacts	

Table 4.2: Probability Index

Severity of harm	Severity index
Impact to people or designated receptor	
Impact to non-designated receptor	
All other impacts	

Table 4.3: Magnitude of risk

Magnitude of risk	Probability index		
Severity index	**Low**	**Medium**	**High**
Low	Low	Low	Medium
Medium	Low	Medium	High
High	Medium	High	High

[1] Natural Resources Wales (2018) Standard rules SR2008No19_250kte – non-hazardous sludge biological, chemical and physical treatment site. [online] Available at: https://naturalresources.wales/media/696605/sr2008-no19-non-hazardous-sludge-biological-chemical-and-physical-treatment-site-v60.pdf Accessed May 2024

Table 4.4: Accident risk assessment table

Data and information				Judgement				Action (by permitting)	
Receptor	**Source**	**Hazard**	**Pathway**	**Probability of exposure**	**Consequence**	**Magnitude of risk**	**Justification for magnitude**	**Risk management**	**Residual risk**
All surface waters close to and downstream of the Site including the River Dee SSSI & SAC (200m) and the Dee Estuary Ramsar and SPA (1100m).	Tank failure, spillages of digestate and/or liquids including oil Damage to drainage system. Spillage of raw materials or sludge/ liquor during delivery/ storage Contaminated run off from cake storage e.g. containing suspended solids.	Acute or chronic effects to aquatic life, contamination and deterioration of water quality.	Direct run-off from the Site across ground surface, via surface water drains, ditches etc. Indirect run-off via the soil layer Transport through soil/groundwater then extraction/ abstraction at borehole or intake.	Low	High	Medium	The River Dee is located approximately 200m from the northern boundary of the Site and is a designated SSSI and SAC. Further downstream, approximately 1,100m from the Site, the Dee Estuary is a designated Ramsar site and Special Protection Area (SPA). Although the river is considered an especially sensitive receptor, the potential for spillage from digestions tanks and storage vessels is considered low and processes on site are generally contained. Potential for leaks from digestion tanks, storage vessels/bays and drainage system which may cause contamination or deterioration of surface water quality. Raw materials and liquids/chemicals are stored in suitable locations on site and are appropriately bunded. Permeable ground surfacing currently surrounds the digesters. Site infrastructure and hardstanding are generally in a good condition. Quantities of liquids and raw materials stored on site are generally low. The magnitude of risk is therefore considered to be high.	The Site drainage plan is documented and all staff are trained in the event of emergency or accident. Impermeable surface and secondary containment, in the form of constructed bunds or portable bunds, is in place around storage areas of all wastes and raw materials and surrounding the STC. Bunding will also be implemented for all raw material storage. Additional containment around digestors and other storage vessels is subject to a risk assessment and will be undertaken as part of the Best Available Technique (BAT) requirements and in accordance with the Construction Industry Research and Information Association (CIRIA) standard 736. Hardstanding is potentially planned to be constructed around the digesters, in line with the recommendations of the CIRIA risk assessment. All transfer of digestate and material takes place under supervision and with flow rate control. All tanks undergo a delegated inspection regime and the process parameters are monitored and understood by site operatives. Digestion tanks are built to appropriate standard and require appropriate bunding. Activities are managed and operated in accordance with the EMS. Spill procedures are in place. All spillages are recorded in the site diary including actions taken. Site Manager ensures the programme of Planned Preventative Maintenance is implemented effectively to minimise the probability of equipment malfunction. Control of substances hazardous to health (COSHH) assessment undertaken for all raw materials. All condensate from the CHP, flare stacks and biogas system discharges into a sealed drainage system and are returned to the head of the works. The condensate is clean, uncontaminated water and is small in quantity. Both clean and contaminated surface water is directed to a pumping station which recirculates it back into the system. The stormwater drainage of potentially contaminated areas from within the Site boundary is routed into the head of the works with no discharge outside of the Site boundary. Regular inspections of the Site drainage systems and other equipment are undertaken, with any repairs and maintenance carried out if necessary.	Low

								All complaints and other incidents are recorded in the site diary including actions taken.	
Abstraction from watercourse downstream of facility (for agricultural or potable use).	Spillage of liquids, contaminated rainwater run-off from waste e.g. containing suspended solids.	Acute effects, closure of abstraction intakes.	Direct run-off from Site across ground surface, via surface water drains, ditches etc. then abstraction.	Low	Medium	Low	Watercourse must have medium / high flow for abstraction to be permitted, which will dilute contaminated run-off. No identified groundwater abstraction is undertaken from nearby watercourses.	The stream that runs through a culvert was recently bunded to reduce runoff. All liquid from site drains are pumped back to the inlet and the Site has no soakaways. Activities are managed and operated in accordance with the EMS. Spill procedures are in place (Appendix A). All spillages are recorded in the site diary including actions taken. No point source emissions to controlled water from the STC. All biogas condensate from the CHP, flare stacks and biogas system discharges into a sealed drainage system to a centrate pumping station and returned to the head of the works. The condensate is clean, uncontaminated water and is small in quantity. Impermeable surface provided for storage of waste and raw materials.	Low
Groundwater, land and surface water	Spillage of liquids, contaminated rainwater run-off from waste e.g. containing suspended solids. Sludge/liquid spillages as a result of loss of tank/pipe integrity/ carelessness during transfer or overfilling. Spillage of sludge/liquids during transfer of imported and indigenous/ unknown sludge and liquids from tankers	Chronic effects: contamination of groundwater, requiring treatment of water or closure of borehole or closure of abstraction intakes. Acute or chronic effects to aquatic life, contamination and deterioration of land and water quality. Pollution of water or land.	Transport through soil/groundwater then extraction/ abstraction at borehole or intake.	Low	Medium	Low	Potential for leaks from digestion tanks and storage vessels. Site infrastructure and hardstanding is generally in a good condition. Quantities of liquids stored are generally low. Underlying superficial Tidal Flat Deposits are designated a Secondary Undifferentiated Aquifer. The underlying Pennine Middle Coal Measure Formation is designated a Secondary A Aquifer. Contaminants sourced from onsite spillages are unlikely to significantly affect groundwater within the underlying aquifers. Quantities of liquids stored are generally low. Potential for spillage during transfer of liquid/sludge from tankers. The Site includes sludge treatment with liquid sludge reception facilities. Reception area for sludge is kept in a good condition.	The inlet works, raw sludge storage tanks, blended sludge tanks, digestor feed, buffer tanks activated sludge process and all sludge treatment processes are covered or enclosed. Spill kits are available near some of the chemical storage. See emergency procedures in Appendix A. Improvements to waste and material storage are being made on site. Impermeable surface and bunds provided for storage of all waste. Activities to be managed and operated in accordance with the EMS and management plans and procedures implemented to reduce spills when transferring liquids/sludges from tankers. All liquid run-off on site is directed to a return pumping station before returning to the head of the works. All transfer of material takes place under supervision and with flow rate control. All primary tanks undergo a delegated inspection regime and the process parameters are monitored and understood by site operatives. Site Manager shall ensure the programme of Planned Preventative Maintenance (PPM) is implemented effectively to minimise the probability of loss of tank/pipe integrity. Activities to be managed and operated in accordance with the EMS. Spill procedures are in place. See emergency procedures in Appendix A. All spillages are recorded in the site diary including actions taken. No point sources to controlled waters. All condensate is discharged into a sealed drainage system and returned to the head of the works.	Low

Groundwater, land and surface water	Damage to drainage system	Acute or chronic effects to aquatic life, contamination and deterioration of land and water quality. Pollution of water or land.	Transport through soil/groundwater then extraction/ abstraction at borehole or intake.	Low	Medium	Low	Presence of Surplus Activated Sludge (SAS) pipework below ground. There is no leak detection of underground pipework on the Site.	Site Manager ensures the programme of PPM is implemented effectively and inspections are carried out frequently to minimise the probability of damage to the drainage system. Activities to be managed and operated in accordance with the EMS.	Low
Groundwater, land and surface water	Flooding of site	If waste is washed off site it may contaminate natural habitats downstream.	Flood waters	Low	Medium	Medium	The area is classified as Flood Zone 3 (high risk) due to its proximity to the River Dee. Site is not known to flood. Permitted waste types are sludges/bio-solids, which may contain pathogens, so any waste washed off site will add to the volume of the local post-flood clean up and may be hazardous to human health.	The drainage network sends water to the head of the works for treatment. There are no direct potentially contaminated discharges to controlled surface waters. Activities are managed and operated in accordance with a management system and management plans and procedures implemented, including (but not limited to) the removal and clean-up of spilled waste material, including sludge, cake etc. and other pollutants (this may also include removal of used spill kits and mobile bunds) before these could enter any flood waters if an event was to occur.	Low
Local human population, domestic properties, site offices.	Spillage of odorous materials including oils, fuels, chemicals. Failure to clean up spillages. Contaminated spill equipment not disposed of appropriately.	Nuisance, loss of amenity.	Air transport then inhalation.	Low	Medium	Low	Local residents and staff often sensitive to odour. Waste processes on site are generally conducted within sealed units. Accidental major spillages are unlikely to occur and cause an odour nuisance.	Procedures for dealing with spillages are covered in the EMS and emergency procedures in Appendix A. The Site Manager shall ensure all relevant staff are appropriately trained to use the spill kits and that all spillages are cleaned up immediately. All areas of the Site are to be cleaned regularly; Site Manager to oversee regular cleaning schedule, all staff trained on importance of good housekeeping and site cleanliness. All spills are recorded in the site diary including actions taken. The Site is monitored for spillages as part of routine inspections. If a spillage occurs, it is washed into site drainage or removed to an appropriate disposal location as soon as possible. If spillages are a recurring incident, investigations into the cause of such occurrences are undertaken, and action taken to minimise these occurrences.	Low
Local human population and / or livestock after gaining unauthorised access to the installation.	All on site hazards: machinery, tanks, wastes and vehicles.	Bodily injury Risk of drowning	Direct physical contact.	Low	Medium	Low	Vehicle movements or equipment malfunction or misuse might result in potential injury to on site personnel. Direct physical contact is minimised by activity being carried out within enclosed digesters so a low magnitude risk is estimated. Access to storage tanks is probable with a risk of drowning. Contact with waste is minimal with exception of leaks or spills from unloading of tanker and transfer of filter cake.	Overall management of the site is overseen by an experienced member of staff having undergone appropriate training under DCWW's accredited Competency Management System (CMS). This competent person delegates responsibilities to appropriately experienced and trained site operatives throughout the operating hours. All operational staff are fully trained in the site operating procedures and safety and environmental management procedures and are kept up to date on changes. Training includes awareness raising of the potential on site hazards and health and safety measures to adhere to. Preventative measures will be under continuous review as part of the EMS procedures. Activities are managed and operated in accordance with the EMS – this includes site security measures	Low

								to prevent unauthorised access. Preventative measures will be under continuous review as part of the EMS procedures. No maintenance work or contractor is permitted on site without a suitable permission to work and qualification. The Site is secured by a combination of fence line of 3m palisade, 3.9m and 2.4m weldmesh, a gated entrance off Factory Road in the south-east and another disused entrance from the A494 in the north, a monitored CCTV system, intruder detection alarms and security rated doors protecting key buildings. Lighting is provided at all reception facilities to give good visibility at all times of the day and night. The Site is monitored 24/7, but only manned between 8am and 4pm with out of hours call out where required. Regular inspections of the boundary fencing and buildings are undertaken to ensure that these have not been compromised and continue to prevent easy access to Site. Repairs are undertaken in accordance with the EMS requirements. Key sludge treatment and wastewater treatment activities undertaken within enclosed systems. Vehicle movements around the Site vary depending on what activities are being undertaken. Cake movement is limited as cake is stored in silos. Cake is removed from Site frequently during specific land spreading windows, or taken to Five Fords for further processing. Waste is removed as required. Therefore, frequent vehicle movements are typically undertaken only by site staff and maintenance contractors.	
Local human population and local environment.	Explosion of biogas and AD causing the release of polluting materials to air (smoke or fumes), water or land	Respiratory irritation, illness and nuisance to local population. Injury to staff or fire fighters. Potential for uncontrolled release of fugitive emissions of gaseous, liquid or solid materials to air, water or land. Acute or chronic effects to aquatic life, contamination and deterioration of land and water quality.	Air transport Direct run-off from site across ground surface, via surface water drains, ditches etc. Indirect run-off via the soil layer Transport through soil/ groundwater then abstraction.	Low	High	Medium	Emissions to air, land or water may cause harm to and deterioration of air, land or water. Smoke and fumes may cause irritation, illness or nuisance to local residents and site staff. An explosion could cause injury to local residents and site staff from flying debris. Although biogas is flammable, risk of direct physical contact is minimised by activity being carried out within the sludge treatment works and in containerised units or locked buildings. Permitted waste types limited to sludges and liquids.	The key sludge treatment and WwTW processes are undertaken within enclosed systems such as the AD and biogas systems. The post digestion tank is not covered but are not considered a fire risk. Activities are managed and operated in accordance with the EMS, H&S and O&M manuals – this includes site security measures to prevent unauthorised access. No maintenance work or contractor is permitted on site without a suitable permission to work and qualification. Fire detection equipment is installed in the CHP containers and the boiler building which activates an alarm on detection of a fire. Slam shut valves on biogas lines will automatically close on detection of a fire to prevent any fuel being supplied to the CHP engines or boilers. Training and regular toolbox talks are given to operatives on site and all operators and staff understand their role in an emergency. The EMS includes procedures relating to maintenance and inspection of bunding of tanks.	Low
Local human population and local environment	Explosion of pressurised tanks due to equipment	Respiratory irritation, illness and nuisance to		Low	High	Medium	Emissions to air, land or water may cause harm to and deterioration of air, land or water.		Low

		and/or process failure.	local population. Fatality/injury to staff, fire fighters. Potential for uncontrolled release of fugitive emissions of gaseous, liquid or solid materials to air, water or land. Acute or chronic effects to aquatic life, contamination and deterioration of land and water quality.					Smoke, fumes and material released from tanks may cause irritation, illness or nuisance to local residents and site staff. Impact from the tank explosion may cause external damages to other equipment, buildings located close to the epicentre of the explosion.	Site Manager shall ensure the programme of PPM is implemented effectively to minimise the probability of fire through faulty plant and equipment. All equipment is checked and calibrated as per the manufacturer's instructions. Emergency operating procedures are in place. Adequate firefighting measures are implemented on site. Regular inspections of the boundary fencing and buildings are undertaken to ensure that these have not been compromised and continue to prevent easy access to the Site. Repairs are undertaken in accordance with the EMS requirements. A Fire Prevention Plan is not required to be submitted for the permit application as the biowaste process on site is wet anaerobic digestion. However, fire prevention and environmental fire risk assessment procedures are provided in the EMS and H&S manual. Firewater within a newly bunded area will be contained by the bund and allow for appropriate disposal. There will be no gravity hydraulic connection from the bund to the drainage system/return to head of works. Manual intervention by an operator will be required to start the pumps and remains subject to the pre-acceptance (sample/test) procedure to ensure the water is appropriate for discharge to head of works. In the event of an incident, depending on the nature of the contamination (firewater in this context) the product will be held within the bund and be subject to alternative disposal methods. Depending on the scale and nature of the incident this may include temporary holding in road tankers to facilitate safe recovery activities. The detail regarding this procedure remains subject to further evaluation as solutions are designed and implemented. Firewater use on other process/equipment areas (which either have existing, or will be provided with new, impermeable surfaces) will drain to site drainage systems. A robust means of isolating the site drainage from returning to the head of works is required. Where sites have pumped return to head of works stopping the pump and ensuring no hydraulic link (syphoning) is required. Where return to head of works is (or could be) gravity returned, a new isolation valve is required which is to be shut in the event of an incident. Implementation of these measures will ensure no firewater returns to the WtW without appropriate controls including sampling/testing. Further design development is underway to determine the most appropriate solution to address this requirement and ensure compliance. There is also Safety zoning of areas under the Dangerous Substances and Explosive Atmospheres Regulations 2002 (DSEAR)/	

								Potentially Explosive Atmospheres (PEXA) on site and smoking is only permitted in designated areas. An accident management plan is part of the EMS and includes measures for security, fire and spill management. Training and regular toolbox talks are given to operatives on site and all operators and staff understand their role in an emergency. The EMS includes procedures relating to maintenance and inspection of tanks. Site Manager shall ensure the programme of PPM is implemented effectively to minimise the probability of fire through faulty plant and equipment. All equipment is checked and calibrated as per the manufacturer's instructions. Emergency operating procedures are in place. Smoking only permitted in designated areas.	
Local human population and local environment.	Flooding of the Site.	If waste is washed off-site it may contaminate buildings / gardens / natural habitats downstream.	Flood waters	Low	Medium	Low	Permitted waste types are sludges/bio-solids, which may contain pathogens, so any waste washed off-site will add to the volume of the local post-flood clean up and may be hazardous to human health. The Site is located within an area of groundwater flooding capability with potential flooding to property situated below ground level and at the surface. There is limited potential for groundwater flooding to occur, however there is the potential for groundwater flooding of property situated below ground level at the south west part of the Site. The Site is located within Flood Zone 3 (high flood risk) for flooding from rivers or sea without defences, due to its proximity to the River Dee, which has a chance of flooding the Site higher than 1:30. The banks of the river (extending north-west / south-east) are recorded to be underlain by made ground (undivided), indicating that flood defences are present.	Most of the Site can be isolated by penstocks or isolation valves. The drainage for the Site goes to the head of the works for treatment. There are no direct potentially contaminated discharges to controlled surface waters. Activities to be managed and operated in accordance with a management system and management plans and procedures implemented, including the removal of spilled waste and other pollutants (such as use of spill kits and mobile bunds) before these could enter any flood waters if an event was to occur.	Low
Local human population and local environment	Accidental fire causing the release of polluting materials to air (smoke or fumes), water or land. Equipment failure	Respiratory irritation, illness and nuisance to local population. Injury to staff or fire fighters. Potential for uncontrolled release of fugitive	Air transport Direct run-off from site across ground surface, via surface water drains, ditches etc. Indirect run-off via the soil layer	Low	High	Medium	Emissions to air, land or water may cause harm to and deterioration of air, land or water. Smoke and fumes may cause irritation, illness or nuisance to local residents and site staff. Although biogas is flammable, risk of direct physical contact is minimised by activity being carried	The key sludge treatment and WwTW processes are undertaken within enclosed systems such as the AD and biogas systems. Activities are managed and operated in accordance with the EMS, H&S and O&M manuals including, fire and spill management. Fire detection equipment is installed in the CHP containers and the boiler building which activate an alarm on detection of a fire. Slam shut valves on	Low

		emissions of gaseous, liquid or solid materials to air, water or land. Acute or chronic effects to aquatic life, contamination and deterioration of land and water quality.	Transport through soil/ groundwater then abstraction.					out within the sludge treatment works and in containerised units or locked buildings. Risk of accidental combustion of waste is minimal. Permitted waste types limited to sludges and liquids.	biogas lines will automatically close on detection of a fire to prevent any fuel being supplied to the CHP engines or boilers. A Fire Prevention Plan is not required to be submitted for the permit application as the biowaste process on site is wet anaerobic digestion and unlikely to cause/or catch fire. However, fire prevention and environmental fire risk assessment procedures are provided in the EMS and H&S manual There is also Safety zoning of areas under DSEAR/PEXA on site and Smoking is only permitted in designated areas. Firewater within a newly bunded area will be contained by the bund and allow for appropriate disposal. There will be no gravity hydraulic connection from the bund to the drainage system/return to head of works. Manual intervention by an operator will be required to start the pumps and remains subject to the pre-acceptance (sample/test) procedure to ensure the water is appropriate for discharge to head of works. In the event of an incident, depending on the nature of the contamination (firewater in this context) the product will be held within the bund and be subject to alternative disposal methods. Depending on the scale and nature of the incident this may include temporary holding in road tankers to facilitate safe recovery activities. The detail regarding this procedure remains subject to further evaluation as solutions are designed and implemented. Firewater use on other process/equipment areas (which either have existing, or will be provided with new, impermeable surfaces) will drain to site drainage systems. A robust means of isolating the site drainage from returning to the head of works is required. Where sites have pumped return to head of works stopping the pump and ensuring no hydraulic link (syphoning) is required. Where return to head of works is (or could be) gravity returned, a new isolation valve is required which is to be shut in the event of an incident. Implementation of these measures will ensure no firewater returns to the WtW without appropriate controls including sampling/testing. Further design development is underway to determine the most appropriate solution to address this requirement and ensure compliance. Training and regular toolbox talks are given to operatives on site and all operators and staff understand their role in an emergency. The EMS includes procedures relating to maintenance and inspection of bunding of tanks, spills and environmental incidents. Site Manager shall ensure the programme of PPM is implemented effectively to minimise the probability of fire through faulty plant and	

								equipment. All equipment is checked and calibrated as per the manufacturer's instructions. Smoking only permitted in designated areas. Emergency operating procedures are in place. Adeqaute firefightinh measures are implemented on site.	
Local human population and local environment.	Arson and/or vandalism causing the release of pollution materials to air (smoke and fumes), water or land	Respiratory irritation, illness and nuisance to local population. Injury to staff, fire fighters or vandals/arsonists. Potential for uncontrolled release of fugitive emissions of gaseous, liquid or solid materials to air, water or land. Acute or chronic effects to aquatic life, contamination and deterioration of land and water quality.	Air transport Spillages and contaminated firewater by direct run-off from site across ground surface, via surface water drains, ditches etc. Indirect run-off via the soil layer Transport through soil/ groundwater then abstraction.	Low	High	Medium	Emissions to air, land or water may cause harm to and deterioration of air, land or water. Smoke and fumes may cause irritation, illness or nuisance to local residents and site staff. Although biogas is flammable, risk of direct physical contact is minimised by activity being carried out within the sludge treatment works and in containerised units or locked buildings. Risk of accidental combustion of waste is minimal. Permitted waste types limited to sludges and liquids.	The key sludge treatment and WwTW processes are undertaken within enclosed systems such as the AD and biogas systems. Activities are managed and operated in accordance with the EMS, H&S and O&M manuals – this includes site security measures to prevent unauthorised access, fire explosions and spill management. No maintenance work or contractor is permitted on site without a suitable permission to work and qualification. Fire detection equipment is installed in the CHP containers and the boiler building which activate an alarm on detection of a fire. Slam shut valves on biogas lines will automatically close on detection of a fire to prevent any fuel being supplied to the CHP engines or boilers. A Fire Prevention Plan is not required to be submitted for the permit application as the biowaste process on site is wet anaerobic digestion. However, fire prevention and environmental fire risk assessment procedures are provided in the EMS and H&S manual. There is also Safety zoning of areas under DSEAR/PEXA on site and Smoking is only permitted in designated areas. Training and regular toolbox talks are given to operatives on site and all operators and staff understand their role in an emergency. The EMS includes procedures relating to maintenance and inspection of bunding of tanks, spills and environmental incidents. Site Manager shall ensure the programme of PPM is implemented effectively to minimise the probability of fire through faulty plant and equipment. All equipment is checked and calibrated as per the manufacturer's instructions. Smoking only permitted in designated areas. Emergency operating procedures are in place. Adequate firefighting measures are implemented on site. Access to site and waste restricted by security fencing. The Site is secured by a combination of fence line of 3m palisade, 3.9m and 2.4m weldmesh, a gated entrance off Factory Road in the south-east and another disused entrance from the A494 in the north, a monitored CCTV system, intruder detection alarms and security rated doors protecting key buildings. Lighting is provided at all reception facilities to give good visibility at all times of the day and night.	Low

								Regular inspections of the boundary fencing and buildings are undertaken to ensure that these have not been compromised and continue to prevent easy access to the Site. Repairs are undertaken in accordance with the EMS requirements. Firewater within a newly bunded area will be contained by the bund and allow for appropriate disposal. There will be no gravity hydraulic connection from the bund to the drainage system/return to head of works. Manual intervention by an operator will be required to start the pumps and remains subject to the pre-acceptance (sample/test) procedure to ensure the water is appropriate for discharge to head of works. In the event of an incident, depending on the nature of the contamination (firewater in this context) the product will be held within the bund and be subject to alternative disposal methods. Depending on the scale and nature of the incident this may include temporary holding in road tankers to facilitate safe recovery activities. The detail regarding this procedure remains subject to further evaluation as solutions are designed and implemented. Firewater use on other process/equipment areas (which either have existing, or will be provided with new, impermeable surfaces) will drain to site drainage systems. A robust means of isolating the site drainage from returning to the head of works is required. Where sites have pumped return to head of works stopping the pump and ensuring no hydraulic link (syphoning) is required. Where return to head of works is (or could be) gravity returned, a new isolation valve is required which is to be shut in the event of an incident. Implementation of these measures will ensure no firewater returns to the WtW without appropriate controls including sampling/testing. Further design development is underway to determine the most appropriate solution to address this requirement and ensure compliance.	
Local human population and local environment.	Operator Error	Pollution to air, land, surface water and groundwater and human health	Air transport Direct run-off from site across ground surface, via surface water drains, ditches etc. Indirect run-off via the soil layer Transport through soil/ groundwater then abstraction.	Low	Medium	Low	Possible contamination to air, land, groundwater and surface water.	Activities to be managed and operated in accordance with the EMS and management plans and procedures implemented. All equipment is checked under preventative maintenance plans and is checked and calibrated as per the manufacturer's instructions. Overall management of the Site is overseen by an experienced member of staff having undergone appropriate training recognised as part of the soon-to-be accredited CMS. This competent person delegates responsibilities to appropriately experienced and trained site operatives throughout the operating hours. All operational staff are fully trained in the site operating procedures and safety and environmental management procedures and are kept up to date on changes.	Low

					Training includes awareness raising of the potential implications of failure to control operations and the potential impact on the environment. Preventative measures will be under continuous review as part of the EMS procedures. Emergency operating procedures are in place. Senior site-based management have direct responsibility for implementing risk management measures.	

5 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 has an accredited Competency Management System under the Competent Operator Scheme.. The Scheme develops technical competency courses and skills to demonstrate that personnel have the appropriate technical skills and knowledge to manage the activities undertaken. The CMS is independently audited by LRQA and was accredited in 2023, in which the Queensferry STC was visited. A copy of the CMS certificate is presented in document reference B16383-123532-XX-XX-CT-ZA-DH0120 - QUY Competency Management System (CMS certificate no: 00039793-007-CMS-ENGUS-UKAS).

6 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 12 months; 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.

7 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 Queensferry STC. 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.

8 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
  - Loss of containment of gaseous substance
  - Loss of containment of liquid substance
  - 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 Natural Resources Wales, 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.

A. Emergency Response Procedures

The following hazards are addressed in specific Emergency Response Procedures (ERP) which will be located at each Emergency Control Centre.

- Fire
- Explosion
- Pollution
- Flooding
- Road traffic accident impact or collision
- Collapse of a structure or building
- Sludge spillage
- Chemical spillage/leak
- Diesel spillage/leak
- Overfilling vessels
- Plant and equipment failures
- Containment failure
- Failure to contain firewater
- Incorrect connection leading to releases to drains and other systems
- Incompatible substances coming into contact
- [placeholder: any other incidents dependent on the info provided by DCWW]

In the event of one or combination of the following incidents occurring, the actions listed in the relevant ERP must be followed.

Details of PEXA (DSEAR) Drawings are given in Appendix B, COSHH Data Sheets in Appendix B, Digester Emergency Plans in Appendix D and Fire Risk Assessment in Appendix E.

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.

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 – 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

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3.0 Record of Change

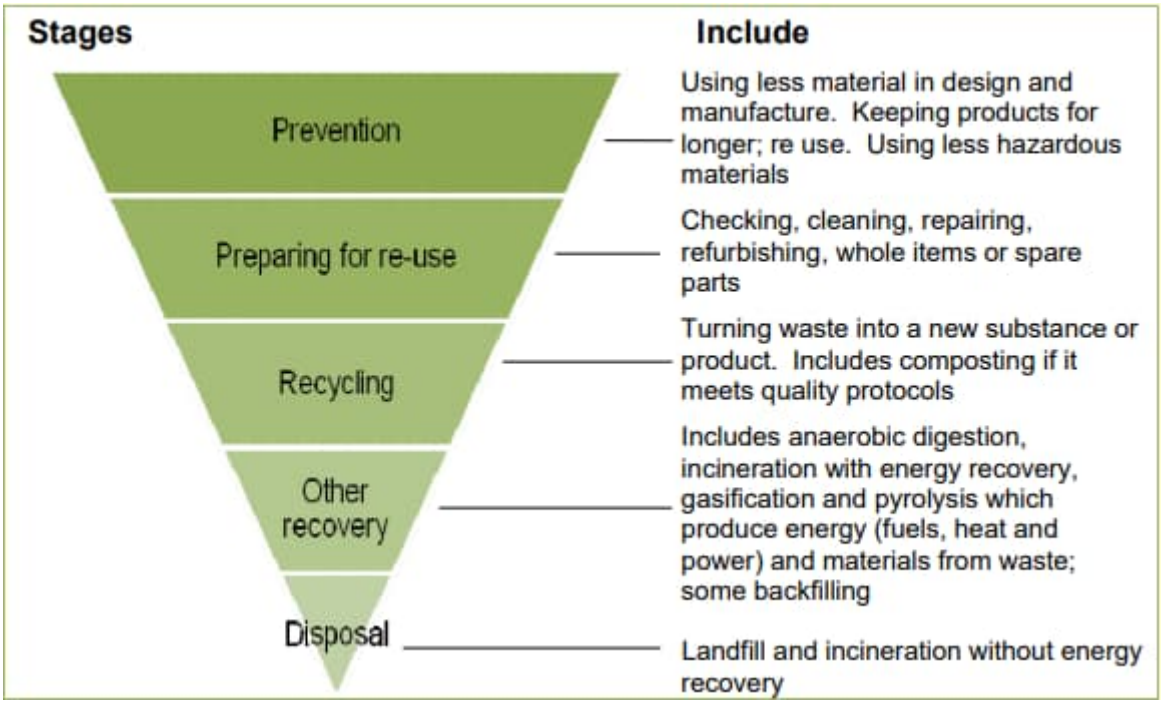
Issue Number & Date	Details of Change
04, 14th March 2016	Section 4.1 & 4.2 amended so that non-hazardous waste doesn't have to be locked and covered but hazardous waste does. Section 4.2 now includes a link to the list of Hazardous Waste Sites. Section 6.2 is new.
05, 10th April 2017	Section 4.2 amended 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.

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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 Handlin and Storage of Oils in conjunction with PO (3) 09 Chemical Deliveries an 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	

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

1.0 Purpose and Scope 1

2.0 Contents 1

3.0 Record of Change 1

4.0 Definitions and Guidance 2

5.0 Local Environmental Emergency Procedures 2

6.0 Reporting of Environment Near Miss Guidance 2

7.0 Reporting route 3

8.0 Records 3

8.1 Records 3

8.2 References 3

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. Followin collaborative working with the Environment Team the procedure has bee revised to improve incident/near miss reporting for biodiversity issues a well as operational issues. Section 4.0, 7.0, 9.2 & 10.0 are totally re-writte 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

1.0 Purpose and Scope 1
2.0 Contents 1
3.0 Record of Change 1
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4.1 Site Initial Environmental Review & Site Environmental Management Plan 2
4.1.1 Waste Management 2
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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.

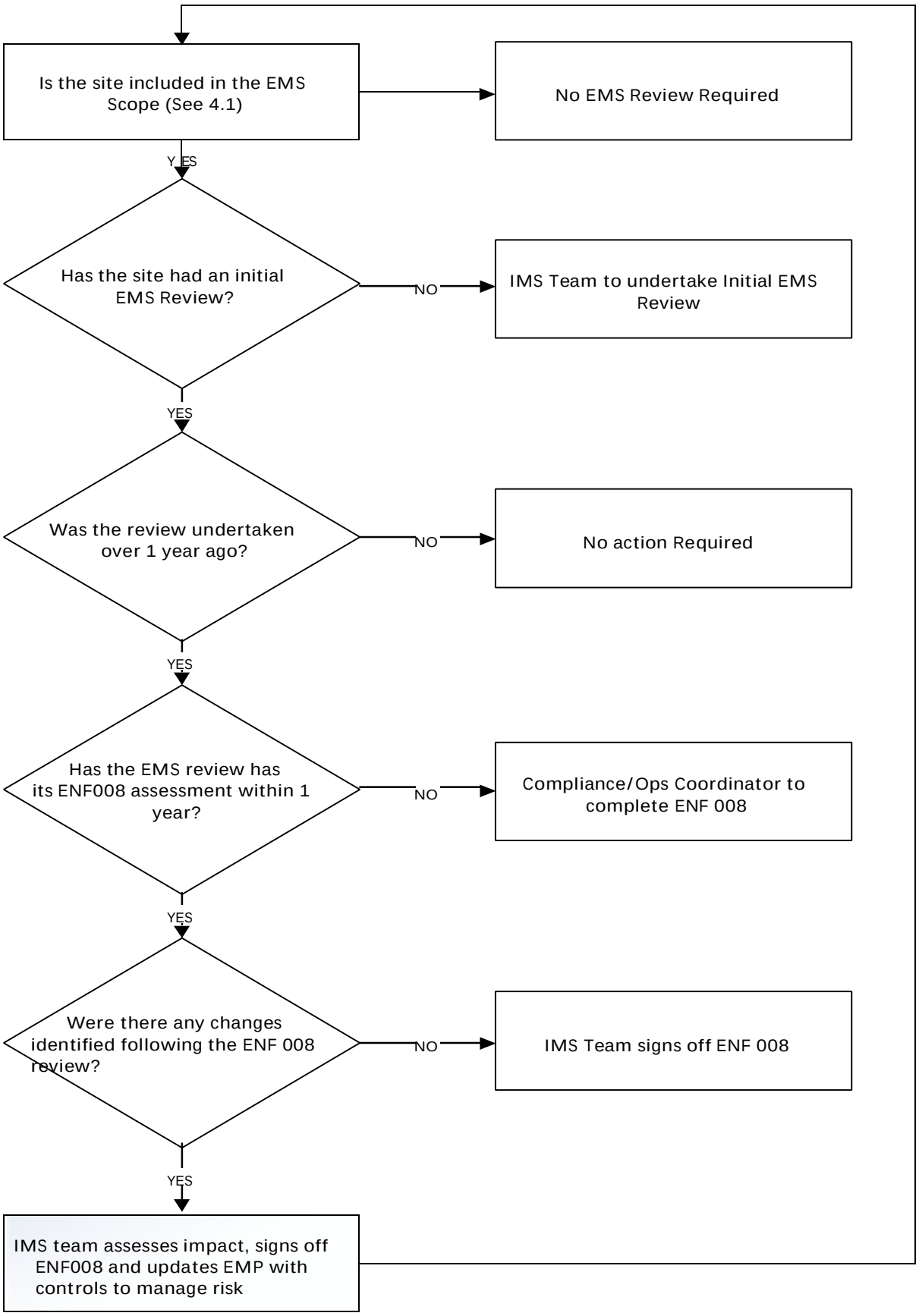
Procedure EN (3) 02 – Waste Management, must be followed with regards to the handling, storage and removal of waste and hazardous waste, from operational sites. Section 4.0 discusses the Waste Management Hierarchy, section 4.1 discusses the requirements for Non-Hazardous Waste, section 4.2 discusses 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



B. PEXA (DSEAR) Drawing

Queensferry WWTW

Potentially Explosive Atmospheres Plan

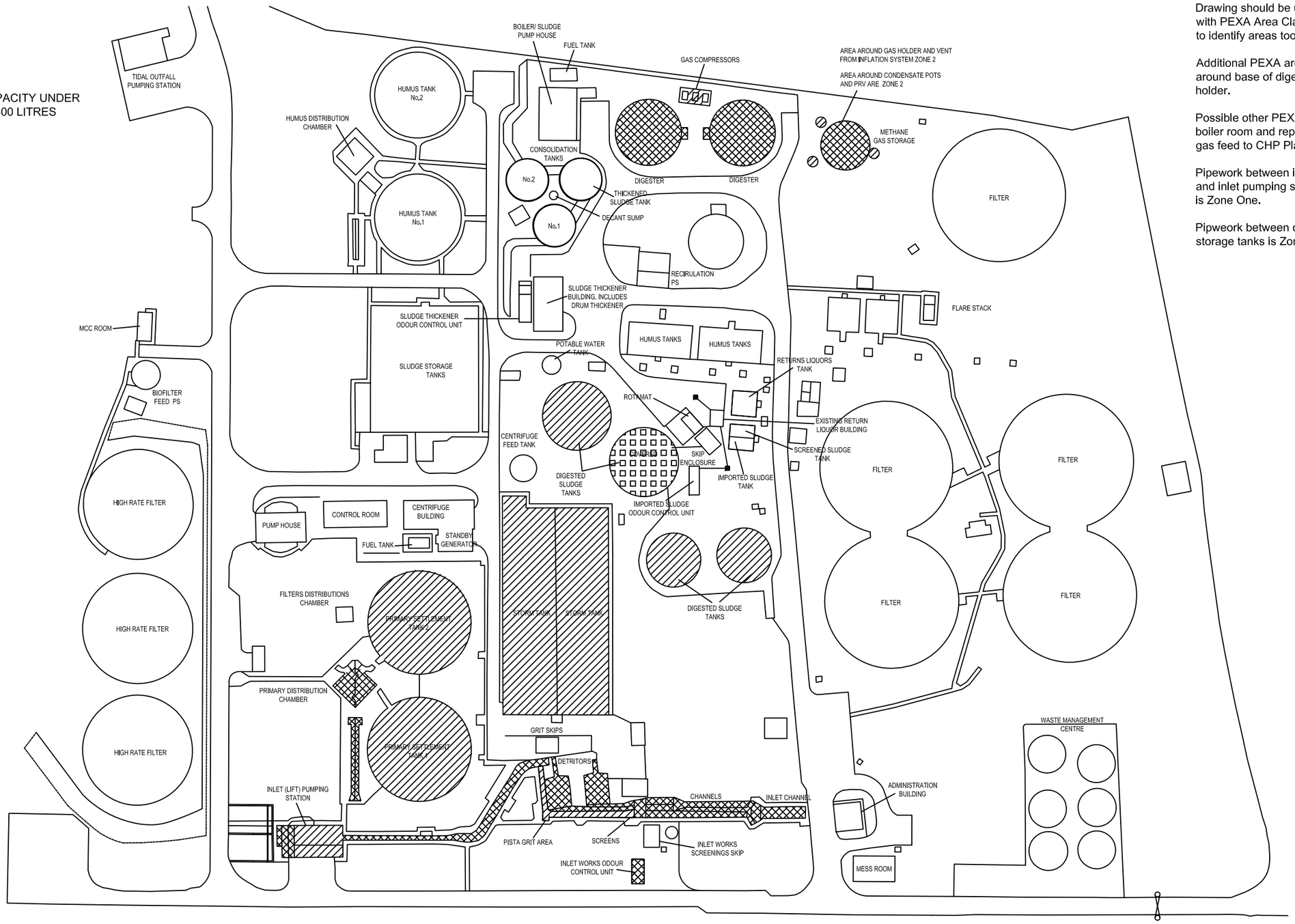
PEXA Plan

ZONE 0

ZONE 1

ZONE 2

MAXIMUM STORAGE CAPACITY UNDER PEXA REGULATIONS IS 400 LITRES



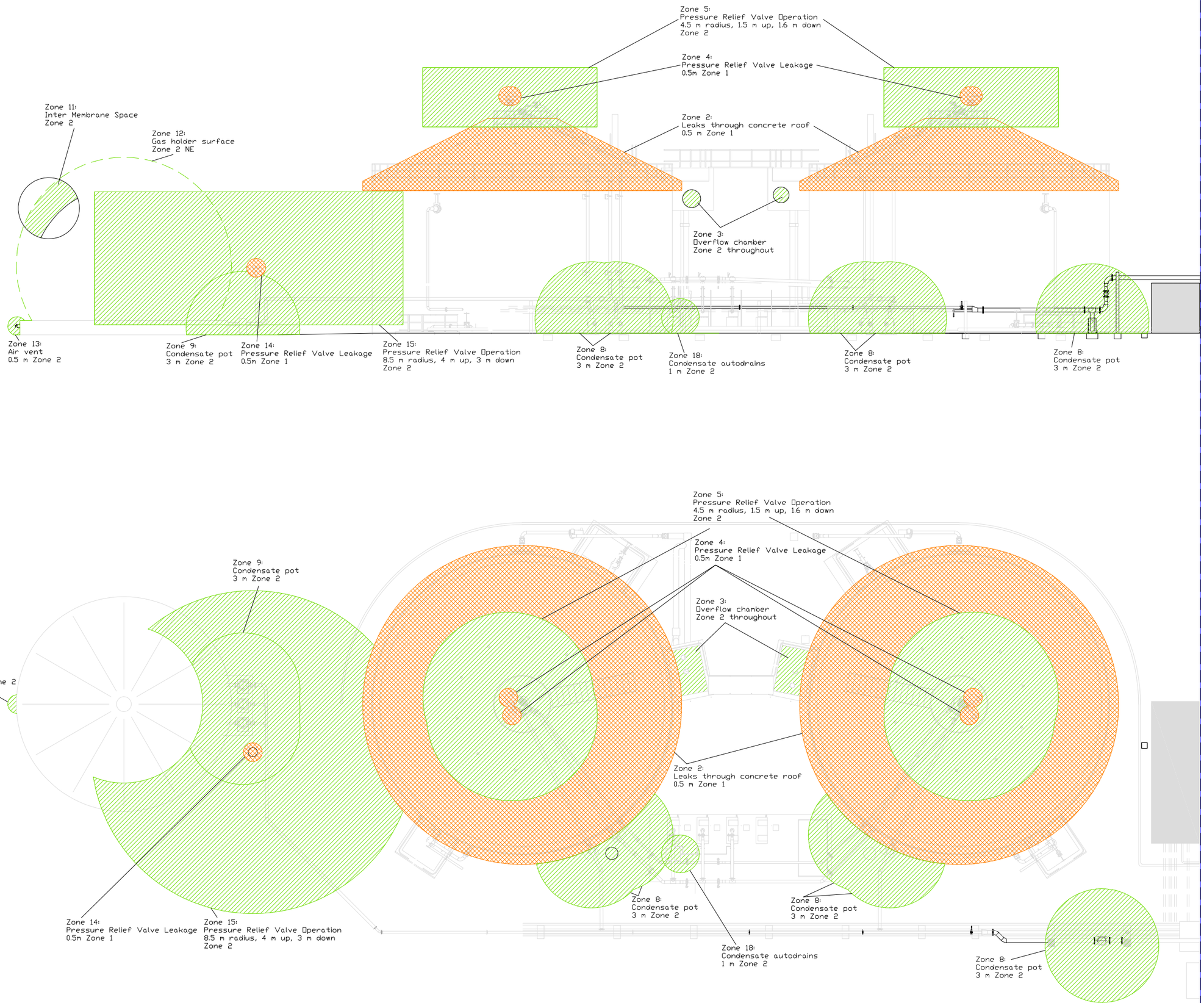
Notes:
Drawing should be used in conjunction with PEXA Area Classification Table to identify areas too small to display.

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.

Pipework between digesters and digested sludge storage tanks is Zone One



PRINCIPLE BIOGAS

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

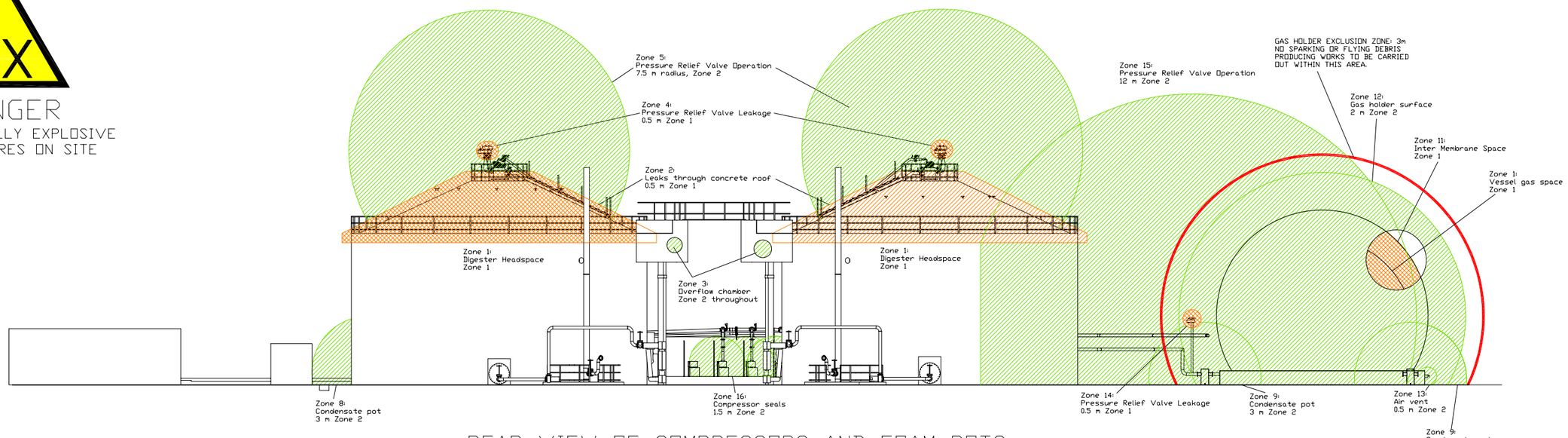
QUEENSFERRY WWTW
FACTORY ROAD
PENTRE
SANDYCROFT INDUSTRIAL ESTATE
FLINTSHIRE
CH5 2QJ

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

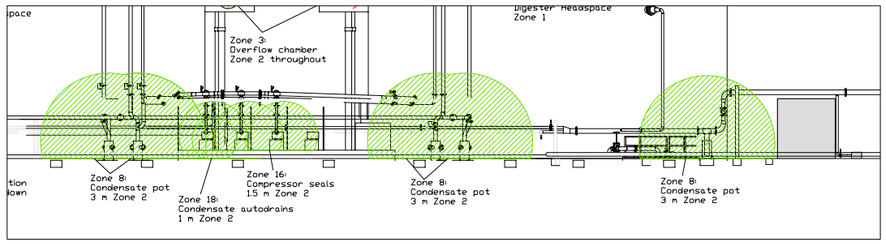
EX

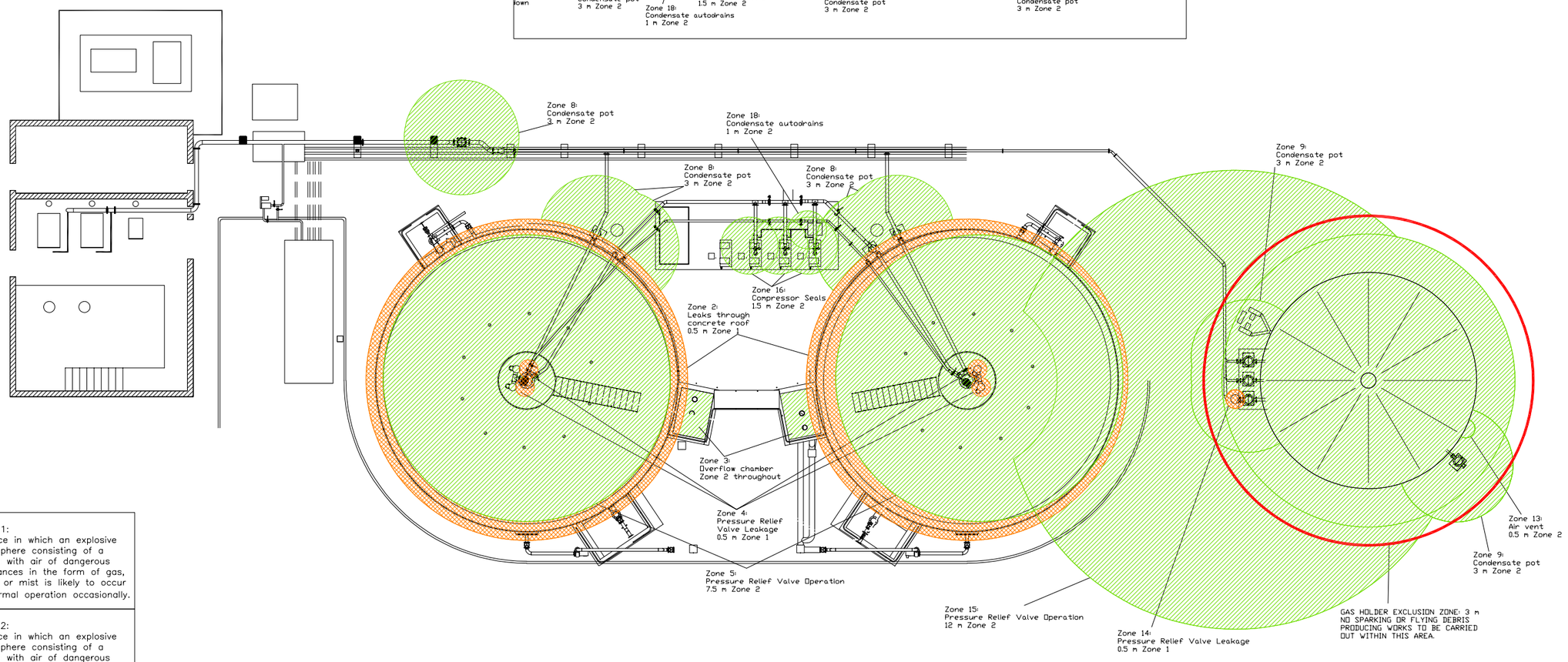
DANGER

POTENTIALLY EXPLOSIVE ATMOSPHERES ON SITE



REAR VIEW OF COMPRESSORS AND FOAM POTS





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 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.

EX

DANGER

POTENTIALLY EXPLOSIVE ATMOSPHERES ON SITE

C. COSHH Data Sheets

COSHH Activity Assessment Report

Substance			
Product Name	Low/Ultra Low Sulphur Diesel	**CAS Number(s)**	Complex mixture of hydrocarbons consisting of paraffins, cycloparaffins, aromatic and olefinic hydrocarbons, predominantly in the C9 to C25 range. 68334-30-5
Trade Name / Synonym(s)	Diesel (ULSD/Gasoil/GO)	**COSHH INDEX Ref No.**	089
WEL	Fuels, diesel LTEL 100mg/m3 Kerosine (petroleum), hydrodesulphurised LTEL 200mg/m3 Cumene LTEL 25ppm 125mg/m3 STEL 50ppm 250mg/m3	**Chemical Identity**	Fuels, diesel Kerosine (petroleum), hydrodesulphurised
Recommended Use And Restrictions On Use	Fuel for diesel engines		

Record Details			
Reference	089- North East Waste	**Assessor Name**	Lydia Hughes
Org Unit	DC -> 1. COSHH Generic RA -> DCWW -> Operations -> Waste Water Services -> Treatment -> North East Catchment	**Job Title**	Lead COSHH Assessor
Location	North East Waste	**Assessment Date**	17/08/2021
Authorised By	Trystan Lewis-Wiliams	**Date Authorised**	23/05/2018
Description	Low/Ultra Low Sulphur Diesel		

Hazards

Classification Type	Classification	Category	Hazard Label	Signal Word	Hazard Statement
Physical	Flammable Liquids	Category 3		Warning	H226: Flammable liquid and vapour
Health	Skin Corrosion/Irritation	Category 2		Warning	H315: Causes skin irritation

COSHH Activity Assessment Report

Health	Acute Toxicity: Inhalation	Category 4		Warning	H332: Harmful if inhaled
Health	Carcinogenicity	Category 2		Warning	H351: Suspected of causing cancer
Health	Specific Target Organ Toxicity (Repeated Exposure)	Category 2		Warning	H373: May cause damage to organs through prolonged or repeated exposure
Environmental	Aquatic Toxicity (Chronic)	Category 2			H411: Toxic to aquatic life with long lasting effects

Tasks

COSHH Activity Assessment Report

Activity Type & Activity Description	Persons At Risk & How Is Person At Risk	Control Measures	Potential Risk Factor	Additional Control Measures	Residual Risk Factor
Use Fuelling vehicles	Colleagues Contact, inhalation	PPE as below NB safety glasses will be used when there is a potential for splashes Ensure good ventilation. Keep away from sources of ignition. Earth bond when transferring from one container to another.	12 - High Risk		4 - Low Risk

Quantity	
Frequency Of Use	
Duration Of Use	
Environment	Enclosed Space
Route Of Entry	Contact
State	Liquid
Approved For Use Within Area?	No

Eye protection must be worn

Safety glasses

Hand protection must be worn

Disposable nitrile gloves

First Aid		Seek Immediate Attention
Inhalation	Remove to fresh air. If rapid recovery does not occur, take patient to nearest medical facility for additional treatment.	No
Skin Contact	Remove contaminated clothing. Immediately flush skin with large amounts of water for at least 15 minutes, and follow by washing with soap and water if available. If redness, swelling, pain and/or blisters occur, transport to the nearest medical facility for additional treatment.	No
Eye Contact	Remove contact lenses. Wash with copious amounts of water for several minutes. If irritation persists, seek medical assistance.	No
Ingestion	If swallowed, do not induce vomiting: transport to nearest medical facility for additional treatment. If vomiting occurs spontaneously, keep head below hips to prevent aspiration. If any of the following delayed signs and symptoms appear within the next 6 hours, transport to the nearest medical facility: fever greater than 101° F (38.3°C), shortness of breath, chest congestion or continued coughing or wheezing. Give nothing by mouth	Yes
Injection		No
Storage		
Storage Measures	Store in a cool, dry and well-ventilated place. Keep protected from direct sunlight and temperatures over 50oC. Maximum size of plastic can is 5 litres.	

COSHH Activity Assessment Report

Emergency Measures	
Loss of containment measures	Absorb into dry earth or sand. Transfer to a closable, labelled salvage container for disposal. Do not flush away traces using water, use detergent to complete cleaning.

Fire Fighting	
Fire Fighting Measures	Foam, water spray or fog. Dry chemical powder, carbon dioxide, sand or earth may be used for small fires only.
Unsuitable Fire Fighting Measures	Do not use direct water jets on the burning product as they could cause a steam explosion and spread of the fire. Simultaneous use of foam and water on the same surface is to be avoided as water destroys the foam.

Transport

Transport Hazard Class(es)	Transport Special Precautions
Class No 3 UN No 1202	If volume transported 1000 litres or less - Limited Scope, if above Full Scope. Please refer to HSP701 Carriage of Dangerous Goods Procedure for further information.

Conclusion			
Conclusion	Medium		
Have you considered using an alternative substance?	Yes		
Reasoning			
Overall Potential Risk Level	12	**Overall Residual Risk Level**	4

COSHH Activity Assessment Report

Substance			
Product Name	Ferric Sulphate PIX 122 & 30-44%	**CAS Number(s)**	Ferric Sulphate 10028-22-5 Ferrous Sulphate 7720-78-7 Manganese Sulphate 77785-87-7
Trade Name / Synonym(s)	iron (III) Sulphate	**COSHH INDEX Ref No.**	040
WEL	Ferric/Ferrous Sulphate (as Fe) ----- Long-term (8-hr TWA ref. period) 1 mg/m3 Short-term (15 min. ref. period) 2 mg/m3	**Chemical Identity**	Ferric Sulphate 40-50% Ferrous Sulphate 0.1-1.5%, Manganese Sulphate ≥0≤1.0%
Recommended Use And Restrictions On Use	Water treatment		

Record Details			
Reference	040 - North East Waste	**Assessor Name**	Lydia Hughes
Org Unit	DC -> 1. COSHH Generic RA -> DCWW -> Operations -> Waste Water Services -> Treatment -> North East Catchment	**Job Title**	Lead COSHH Assessor
Location	Ty Gwyn WWTW Mold WWTW Cefn Mawr WWTW Llangollen WWTW Farndon WWTW Gresford WWTW Hope WWTW Lavister WWTW Tattenhall WWTW Whitchurch WWTW Malpas WWTW Queensferry WWTW	**Assessment Date**	22/07/2020
Authorised By	Henryk J. Freyer	**Date Authorised**	27/04/2017
Description	Ferric Sulphate PIX 122 & 30-44%		

Hazards

Classification Type	Classification	Category	Hazard Label	Signal Word	Hazard Statement
Health	Serious Eye Damage/Eye Irritation	Category 1		Danger	H318: Causes serious eye damage

COSHH Activity Assessment Report

Health	Acute Toxicity: Oral	Category 4		Warning	H302: Harmful if swallowed
Health	Skin Corrosion/Irritation	Category 2		Warning	H315: Causes skin irritation

Tasks

Activity Type & Activity Description	Persons At Risk & How Is Person At Risk	Control Measures	Potential Risk Factor	Additional Control Measures	Residual Risk Factor
Use Wastewater treatment	Site colleagues Contact	PPE as below required where there is potential of contact with the substance - substance is normally enclosed within the delivery and dosing system. Avoid contact with skin, eyes and clothing. The work place and work methods shall be organized in such a way that direct contact with the product is prevented or minimized. Eye wash bottle or emergency eye-wash fountain must be found in the work place. Ensure adequate ventilation.	12 - High Risk	Safe Working Method PPE	2 - Low Risk

Quantity	
Frequency Of Use	
Duration Of Use	
Environment	Enclosed Space
Route Of Entry	Contact
State	Liquid
Approved For Use Within Area?	Yes

Eye protection must be worn

Safety goggles

Hand protection must be worn

Gauntlet - PVC

Overall/Body Covering must be worn

Chemical Suit Chemmaster Hooded

Protective footwear must be worn

Safety Wellington

First Aid	Seek Immediate Attention

Inhalation	Remove casualty to fresh air and keep at rest. If breathing is irregular or stopped, administer artificial respiration. If unconscious place in recovery position. Call a physician immediately.	Yes
Skin Contact	Take off contaminated clothing and shoes immediately. Rinse with plenty of water. If symptoms persist, call a physician. Burns must be treated by a physician. Wash contaminated clothing before re-use.	No
Eye Contact	Important! Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. If possible use lukewarm water. Call a physician and/or immediately transport to an emergency facility.	Yes
Ingestion	Rinse mouth with water. Drink 1 or 2 glasses of water or milk. Do NOT induce vomiting. Consult a physician.	Yes
Injection	Not likely route of exposure	No

Storage

Storage Measures	Keep tightly closed in a dry and cool place. Keep away from heat. Keep in a well-ventilated place. Keep at temperatures above 0°C.

Emergency Measures

Loss of containment measures	Spillage a. Small Dilute residues with water and then neutralize with lime powder to a solid consistency. Shovel or sweep up and transfer to suitable closed containers. Flush spillage areas with plenty of water. b. Large Remove spill using a vacuum tanker, then as above.

Fire Fighting

Fire Fighting Measures	In the event of fire, wear self-contained breathing apparatus. Wear appropriate body protection (full protective suit). Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Heating above the decomposition temperature will release toxic gases, Sulphur oxides (SOx).
Unsuitable Fire Fighting Measures	None indicated

Transport

	Transport Hazard Class(es)	**Transport Special Precautions**
	Class 8 UN Ref. 3264	ADR Packaging Group III Refer to Carriage of Dangerous Goods Procedure

Conclusion

Conclusion	Risk of exposure is very small if Safe working method is followed and all PPE is work correctly
Have you considered using an alternative substance?	Yes

COSHH Activity Assessment Report

Reasoning	Process specific		
Overall Potential Risk Level	12	**Overall Residual Risk Level**	2

COSHH Activity Assessment Report

Substance			
Product Name	Flopam EM - 4 series, 840 series, 640 series and FB508	**CAS Number(s)**	920-107-4
Trade Name / Synonym(s)	Flopam EM - 4 series, 840 series, 640 series and FB508	**COSHH INDEX Ref No.**	043
WEL	As dust LTEL 10mg/m3	**Chemical Identity**	
Recommended Use And Restrictions On Use	sludge thickener		

Record Details			
Reference	043 North East Waste	**Assessor Name**	Lydia Hughes
Org Unit	DC -> 1. COSHH Generic RA -> DCWW -> Operations -> Waste Water Services -> Treatment -> North East Catchment	**Job Title**	Lead COSHH Assessor
Location	North East Waste	**Assessment Date**	12/08/2021
Authorised By		**Date Authorised**	
Description	Flopam EM - 4 series, 840 series, 640 series and FB508		

Hazards

Classification Type	Classification	Category	Hazard Label	Signal Word	Hazard Statement
Health	Acute Toxicity: Oral	Category 4		Warning	H302: Harmful if swallowed
Health	Aspiration Hazard	Category 1		Danger	H304: May be fatal if swallowed and enters airways
Health	Serious Eye Damage/Eye Irritation	Category 2A		Warning	H319: Causes serious eye irritation

Tasks

COSHH Activity Assessment Report

Activity Type & Activity Description	Persons At Risk & How Is Person At Risk	Control Measures	Potential Risk Factor	Additional Control Measures	Residual Risk Factor
Use Processing aid for water treatment	Site colleagues Contact	PPE as below. Ensure adequate ventilation.	6 - Medium Risk		4 - Low Risk

Quantity	
Frequency Of Use	
Duration Of Use	
Environment	Enclosed Space
Route Of Entry	Contact
State	Liquid
Approved For Use Within Area?	Yes

Eye protection must be worn

Safety glasses

Hand protection must be worn

Disposable nitrile gloves

First Aid		Seek Immediate Attention
Inhalation	Move to fresh air.	No
Skin Contact	Wash off with soap and water, while removing all contaminated clothing and shoes. Get medical attention if irritation develops & persists.	No
Eye Contact	Immediately flush eyes with water, also under the eye-lids, for at least 15 minutes. Obtain medical assistance immediately.	Yes
Ingestion	Rinse mouth with water. DO NOT induce vomiting. Seek medical attention immediately.	Yes
Injection		No
Storage		
Storage Measures	Keep away from heat and sources of ignition. Keep containers closed when not in use.	
Emergency Measures		
Loss of containment measures	DO NOT FLUSH WITH WATER. Soak up with inert absorbent material and transfer to suitable closed containers for disposal. After cleaning flush away traces with water.	
Fire Fighting		
Fire Fighting Measures	Water, water spray, foam, carbon dioxide, dry powder	

COSHH Activity Assessment Report

Unsuitable Fire Fighting Measures	None		
Transport			
	Transport Hazard Class(es)	**Transport Special Precautions**	
Conclusion			
Conclusion	Low		
Have you considered using an alternative substance?	Yes		
Reasoning			
Overall Potential Risk Level	6	**Overall Residual Risk Level**	4

COSHH Activity Assessment Report

Substance			
Product Name	Flopam FO 4498 SSH	**CAS Number(s)**	Mixture - see SDS
Trade Name / Synonym(s)	Flopam FO 4498 SSH	**COSHH INDEX Ref No.**	1455
WEL	N/A	**Chemical Identity**	N/A
Recommended Use And Restrictions On Use	Sludeg thickener		

Record Details			
Reference	1455 - North East Waste	**Assessor Name**	Lydia Hughes
Org Unit	DC -> 1. COSHH Generic RA -> DCWW -> Operations -> Waste Water Services -> Treatment -> North East Catchment	**Job Title**	Lead COSHH Assessor
Location	Chester WWTW Queensferry WWTW	**Assessment Date**	07/09/2021
Authorised By		**Date Authorised**	
Description	Flopam FO 4498 SSH		

Hazards

Classification Type	Classification	Category	Hazard Label	Signal Word	Hazard Statement
Not Classified	Not Classified	Not Classified			

Tasks

COSHH Activity Assessment Report

Activity Type & Activity Description	Persons At Risk & How Is Person At Risk	Control Measures	Potential Risk Factor	Additional Control Measures	Residual Risk Factor
Use Sludge thickener	Site colleagues Contact. Alse renders surfaces slippery when in contact with water.	PPE as below. Avoid contact with skin and eyes. Avoid dust formation. Avoid breathing dust. Wash hands before breaks and at the end of work day. Ensure adequate ventillation.	4 - Low Risk		1 - Low Risk

Quantity	
Frequency Of Use	
Duration Of Use	
Environment	Enclosed Space
Route Of Entry	Contact
State	Dust
Approved For Use Within Area?	Yes

Eye protection must be worn

Safety glasses

Hand protection must be worn

Disposable nitrile gloves

First Aid		Seek Immediate Attention
Inhalation	Move to fresh air. Get medical attention if symptoms occur.	No
Skin Contact	Wash off with soap and plenty of water. Get medical attention if irritation develops and persists.	No
Eye Contact	Rinse immediately with plenty of water, also under the eyelids. Get medical attention.	Yes
Ingestion	Rinse mouth. If conscious, give the victim plenty of water to drink. Induce vomiting, but only if victim is fully conscious.	No
Injection		No
Storage		
Storage Measures	Keep in a dry place. Incompatible with oxidizing agents.	
Emergency Measures		
Loss of containment measures	Do not flush with water. Clean up promptly by sweeping or vaccum. For large spills prevent unauthorised access, sweep up and shovel into suitable containers for disposal. After cleaning flush away traces with water.	
Fire Fighting		
Fire Fighting Measures	Water, foam, CO2, dry powder.	

COSHH Activity Assessment Report

Unsuitable Fire Fighting Measures	N/A		
Transport			
	Transport Hazard Class(es)	**Transport Special Precautions**	
	N/A	N/A	
Conclusion			
Conclusion			
Have you considered using an alternative substance?	No		
Reasoning			
Overall Potential Risk Level	4	**Overall Residual Risk Level**	1

Flammable Material List & Characteristics

Hazardous Area Classification				Part I Flammable Material List & Characteristics						Table C.1 BS EN 60079-10-1				
Plant	Wykey (Pasteuriser & Secondary Digester)									Reference Drawing (ATEX zoning drawing)				
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Flammable Material				LEL		Volatility								
No.	Name	Composition	Flashpoint	kg/m^3	vol %	Vapour Pressure (kPa)	Melting Point deg C	Boiling Point degC	Index of Expansion	Relative Density Gas/Air	Ignition Temp degC	Group	Temp class	Comments
1	Biogas	53% Methane 47% CO2	<0	0.0333	5	not applicable	-181	-161	1.32	0.95 mixed Methane 0.6	595	II	T1	Methane proportions vary from 48-58%
2	Hydrogen Sulphide	0-300ppm	<0	1.36	4	not applicable	-82.9	-60.2		1.189	260	II	T1	40,000ppm = LEL. No occurance of this concentration
3	Ammonia				16	not applicable	-78	-33		0.6	630	II	T1	160,000ppm = LEL. No occurance of this concentration
4	Hydrogen		<0	0.082	4	not applicable	-259.2	-252.9		0.09	500	IIC		4% concentration in air, no occurance of this concentration in biogas.

Glossary

"Group"	gas flammability group
II	General
IIA	Propane etc
IIB	Ethylene etc
IIC	Hydrogen etc

Temp Class	Max surface temperature deg. C
T1	450
T2	300
T3	200
T4	135
T5	100
T6	85

Source of Release Table

Hazardous Area Classification				Part II Source Of Release Table									Table C.1 BS EN 60079-10-1		
Plant	Abbotsmoor												Reference Drawing (ATEX zoning drawing)		
1	2	3	4	5	6	7	8			9	10	11	12	13	
	Source of Release			Flammable material				Ventilation			Hazardous Area				
No	Description	Location	Grade of release	Materials Ref Table	Operating Temperature degC	Operating Pressure	State	Type	Degree	Available	Zone	Extent Vertical	Extent Horiz (radii)	Reference	Remarks
1	Vessel headspace	Digester	P	1	40	20 mbar	G	N/A	L	P	Safe	-	-		Safe Area: Biogas is produced & vessel held under positive pressure under normal operation.
2	Cracks in concrete, above liquid level	Digester	S	1	40	20 mbar	G	N	M	G	1	0.5 m	0.5 m	IGEM/SR/25 Equation 5.2	2.5mm2 hole size (adverse conditions)
3	Overflow chamber	Digester	P	1	40	atmospheric	G	N	M	G	2	Throughout	Throughout		
4	Pressure relief valve seat leakage	Digester	P	1	40	20 (30) mbar	G	N	M	G	1	0.5 m	0.5 m	IGEM/SR/25 5.2.3	less than 7 bar set pressure
5	Pressure relief valve operation	Digester	S	1	40	20 (30) mbar	G	N	M	G	2	1.5 m (up) & 1.625 (down)	4.5 m	IGEM/SR/25 Fig 13, Tables 14 & 15	See Calculation 1 for release rate calculation
6	Internals	Gas pipework	P	1	40	0.02-2 bar	G	N/A	L	P	Safe	-	-		Safe Area: Biogas is produced & held under positive pressure under normal operation.
7	Flanges & Fittings	low pressure pipework	S	1	40	20 mbar	G	N	M	G	2	NE	NE	IGEM/SR/25 Fig 1 Table 1	
8	Condensate dip pipe	Digester gas take offs	S	1	40	20 mbar	G	N	M	G	2	3 m	3 m	IGEM/SR/25 5.2.7.1.3 & 4, Table 3	Constant top up due to biogas condensate drop out, daily checks on level
9	Condensate pot	Gas Holder	S	1	40	20 mbar	G	N	M	G	2	3 m	3 m	IGEM/SR/25 5.2.7.1.3 & 4, Table 3	Constant top up due to biogas condensate drop out, daily checks on level
10	Inner membrane space	Gas Holder	P	1	40	20 mbar	G	N/A	L	P	Safe	-	-		Safe Area: Biogas is produced & held under positive pressure under normal operation.
11	Inter membrane space	Gas Holder	S	1	40	20 mbar	G	F	H	G	2	Throughout	Throughout		Precautionary zone against small leaks
12	Surface	Gas Holder	S	1	40	20 mbar	G	N	M	G	2	NE	NE		Precautionary Zone against double leak
13	Air Vent	Gas Holder	S	1	40	20 mbar	G	F	H	G	2	0.5	0.5		DCWW PEXA Handbook 2016 (11.14)
14	Pressure relief valve seat leakage	Gas Holder	S	1	40	20 (24) mbar	G	N	M	G	1	0.5 m	0.5 m	IGEM/SR/25 5.2.3	less than 7 bar set pressure
15	Pressure relief valve operation	Gas Holder	S	1	40	20 (24) mbar	G	N	M	G	2	4 m (up) & 3 m (down)	8.5	IGEM/SR/25 Fig 13, Tables 14 & 15	See Calculation 4 for release rate calculation
16	Compressor seal	Gas mixing compressors	S	1	120	2 bar	G	N	M	G	2	NE	NE	IGEM/SR/25 5.2.6.1 Table 1	Adverse Conditions
17	Flanges & Fittings	High pressure pipework	S	1	120	2 bar	G	N	M	G	2	NE	NE	IGEM/SR/25 5.2.6.1 Table 1	Adverse Conditions
18	Condensate Autodrains	Gas Mixing Compressors	S	1	120	2 bar	G	N	M	G	2	1 m	1 m	IGEM/SR/25 Equation 5.1	2.5mm2 hole size (adverse conditions)
19	Condensate sump	Gas holder	S	1	ambient	atmospheric	G	N	M	G	Safe	-	-		Multiple air breaks and de-pressurised condensate.
20	Flanges & fittings	Boiler House	S	1	40	20 mbar	G	F	H	G	2	NE	NE	IGEM/SR/25 5.2.6.1 Table 1 A6.2.1	Large ventilation louvres & extract fans create good cross flow of air across equipment.

State
S Solid
L Liquid
G Gas

Grade of Relea (source: IGEM/SR/25 4.4)
C A continuous (C) grade of release is defined as a release which is continuous or is expected to occur frequently or for long periods
P A primary (P) grade of release is defined as a release which can be expected to occur periodicallyor occassionally during normal operation
S A secondary (S) grade of release is defined as a release which is not expected to occur in normal operation and, if it does occur, is likely to do so only infrequently and for short periods

Ventilation
Type
N Natural
F Forced (fans)

Degree
H High
M Medium (Outdoors)
L Low

Available
G Good mixing availability of ventilation
F Fair
P Poor mixing availability

Calculation 1:

Digester Pressure Relief Valve

Digester Volume	1650	
Biogas production rate (m3/m3/day)	2.5	
Daily gas production	4125	m3/day
Gas flow rate	171.9	m3/hr
Biogas production	171.9	m3/hr
Methane content	53	%
Methane flow	91.09375	m3/hr
density of methane	0.656	kg/m3
methane mass flow	59.8	kg/hr
mass flow rate	**0.0166**	kg/s
2 relief valves	0.0083	ks/s/valve

Calculation 2:

Release from orifice: Condensate trap

Taken from IGEM/SR/25 Edition 2 5.2.2.2

For OP < 850 mbar

$$G = 1500 C_d A M^{0.5} T^{-0.5} P^{0.5}$$

Where:

OP = Operating Pressure (bar)	<850mbar	
G' = Mass Flow Rate (kg/s) Methane	**0.080068828**	kg/s (methane)
G = Mass Flow Rate (kg/s) Biogas	0.1404716	kg/s (biogas)
M = Molecular weight (kg/kmol)	28.0671	(assuming methane)
T = Gas temperature upstream of the orifice (K)	308.15	K
P = Gas pressure (bar)	0.025	bar
C_d = Coefficient of discharge of orifice	1	
A = Cross sectional area of orifice m^2	0.0019625	m^2

Molecular weight calculator

Methane:	16.04	g/mol
Carbon dioxide:	44.01	g/mol
Methane content	57	%
Carbon dioxide content	43	%
Overall molecular weight	28.0671	g/mol

cross sectional area calculator

diameter of pipe	0.05	m
CSA	0.00196	m2
CSA of water bath opening	0.045	m2
width	0.3	m
depth	0.15	m

Table 27 result:	14m	Zone 2 radius	
(using downward pointing vent, low level as proxy for this non-ideal release)			

Sphere volume	11,488.89	m3
sphere raduis	**14.0**	**m**

Gas required to fill a sphere to LEL (9% biogas)

Gas Holder Volume	1000	m3
Biogas LEL	9	%
Safety Margin	50	%
Sphere Volume	22,222.22	m3
sphere raduis	**17.4**	**m**
Duration of release:	7118.9	Seconds
	118.6	minutes

Calculation 3:

Release from orifice: Pressurised Condensate Autodrain

Taken from IGEM/SR/25 Edition 2 5.2.2.2

For OP over 850 mbar

$$G = 675 * Cd * a * M^{0.5} * T^{-0.5} * (P + 1.013)^{1.05}$$

Where:

OP = Operating Pressure (bar)	<850mbar		
G' = Mass Flow Rate (kg/s) Methane	**0.000654913**	kg/s (methane)	
G = Mass Flow Rate (kg/s) Biogas	0.0011490	kg/s (biogas)	
M = Molecular weight (kg/kmol)	28.0671	(see below)	
T = Gas temperature upstream of the orifice (K)	393.15	K	
P = Gas pressure (bar)	2	bar	
C_d = Coefficient of discharge of orifice	0.8		
A = Cross sectional area of orifice m^2	2.50119E-06	m^2	

Molecular weight calculator

Methane:	16.04	g/mol
Carbon dioxide:	44.01	g/mol
Methane content	57	%
Carbon dioxide content	43	%
Overall molecular weight	28.0671	g/mol

cross sectional area calculator

diameter of pipe	1.785	mm
diameter of pipe	0.001785	m
CSA	2.50119E-06	m2

Calculation 4:

Gas Holder Pressure Relief Valve

Daily gas production	8250	m3/day
Gas flow rate	343.8	m3/hr
Biogas production	343.8	m3/hr
Methane content	53	%
Methane flow	182.1875	m3/hr
density of methane	0.656	kg/m3
methane mass flow	119.5	kg/hr
mass flow rate	**0.0332**	kg/s
2 relief valves	0.0166	ks/s/valve

Gas leak: Condensate Pots						
		Area				
		MacMillan eq4.3	MacMillan eq4.1	IGE/SR/25 "5.2.3.2" super 850mbar	IGE/SR/25 "5.2.3.2" sub 850mbar	BS EN 60079-10-1:2009 subsonic
Process conditions						
~~V~~	~~m^3~~	~~500.0~~	~~500.0~~	~~500.0~~	~~500.0~~	~~500.0~~
T	C	40	40	120	120	40
T_{abs}	k	313.15	313.15	393.15	393.15	313.15
P	$mbar_g$	0	0	2000	2000	0
P	Pa	0	0	200000	200000	0
P_{abs}	mbar	1013.25	1013.25	3013.25	3013.25	1013.25
P_{abs}	Pa	101325	101325	301325	301325	101325
Gas density	kg/m3	1.11	1.11	2.64	2.64	1.11
Standard conditions						
V	Nm^3	~~436.1~~	~~436.1~~	~~1033.1~~	~~1033.1~~	~~436.1~~
T	C	0	0	0	0	0
T_{abs}	k	273.15	273.15	273.15	273.15	273.15
P	mbar	0	0	0	0	0
P	Pa	0	0	0	0	0
P_{abs}	mbar	1013.25	1014.25	1014.25	1014.25	1014.25
P_{abs}	Pa	101325	101325	101325	101325	101325
Gas composition						
CH4	%	55	55	55	55	55
CO2	%	45	45	45	45	45
Specific gravity	kg/Nm3	1.28	1.28	1.28	1.28	1.28
molecular weight	g/mol	28.6	28.6	28.6	28.6	28.6
Biogas weight	kg	556.85	556.85	1319.01	1319.01	556.85
Gas release						
orifice diameter	m	0.001785	0.001785	0.001785	0.001785	0.001785
orifice area	m2	2.50119E-06	2.50119E-06	2.50119E-06	2.50119E-06	2.50119E-06
orifice area	mm^2	2.50	2.50	2.50	2.50	2.50
Universal gas constant	J/kmol.K	8314	8314	8314	8314	8314
Polytropic index of adiabatic expansion y		1.32	1.32	1.32	1.32	1.32
Coefficient of discharge		0.80	0.80	0.80	0.80	0.80
Pressure difference	Pa	0	0	200000	200000	0
Mass release (dG/dt)	**kg/s**	**0.00058**	**0.00046**	**0.00116**	**0.00114**	**0.00000**
Volumetric release	m3/s	0.00046	0.00036	0.00091	0.00090	0.00
Volumetric release	m3/h	1.64	1.30	3.27	3.23	0.00
Sonic velocity (MacMillan)	m/s	346.65	346.65	388.41	388.41	346.65
Sonic velocity (BS EN)	m/s	323.75	323.75	323.75	323.75	323.75
Gas release velocity (BS EN)	m/s	208.77	165.06	175.89	173.61	0.00
Zone extent						
Grade of release		zone 2	zone 2	zone 2	zone 2	zone 2
Safety factor k		50%	50%	50%	50%	50%
Biogas LEL		8.00%	8.00%	8.00%	8.00%	8.00%
LELm	kg/m3	0.10	0.10	0.10	0.10	0.10
Minimum volumetric flowrate of fresh air (dV/dt)min	m3/s	0.01	0.01	0.03	0.03	0.00
	m3/h	43.79	34.62	109.71	108.28	0.00
Distance to LEL (X) for low release velocity	m	2.68	2.36	4.45	4.42	0.00
Distance to LEL (X) for high velocity	m					

Zone extent						
Grade of release		zone 2	zone 2	zone 2	zone 2	zone 2
Safety factor		50%	50%	50%	50%	50%
Mass release with Safety f.	kg/s	0.0012	0.0009	0.0023	0.0023	0.0000
air change rate	change/s	0.0217	0.03	0.03	0.03	0.03
Biogas LEL	kg/m3	#REF!	#REF!	#REF!	#REF!	#REF!
cloud at 50% LEL	m3	0.054	0.031	0.077	0.076	0.000
Cloud shape		Hemisphere	Hemisphere	Sphere	Hemisphere	Sphere
coeff		2	2	2	2	4
Zone Extent	m	0.635	0.528	0.717	0.714	#NUM!
MB Zone Extent	m				**1**	

D. Digester Emergency Plans

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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	John Humphreys	07825402602
Designated Digester safety Controllers	Frank Esposito	07771353195
Smart Hub	Various	03033130103
Logistics	Various	07774223671
Specialist support will at times be required for these instructions:		
Mechanical, electrical, biological and process problems (24 hrs)	Principle Biogas	03332079991
CHP	Centrica	
Local Fire service (non emergency)	Deeside Fire Station/ Gorsaf Dan	01244 813 512
Fire & Emergency	Fire Service	999
Environmental Impact	Natural Resources Wales	0345 988 1188

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10	Pressure Relief Valve (PRV) Leak
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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

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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)

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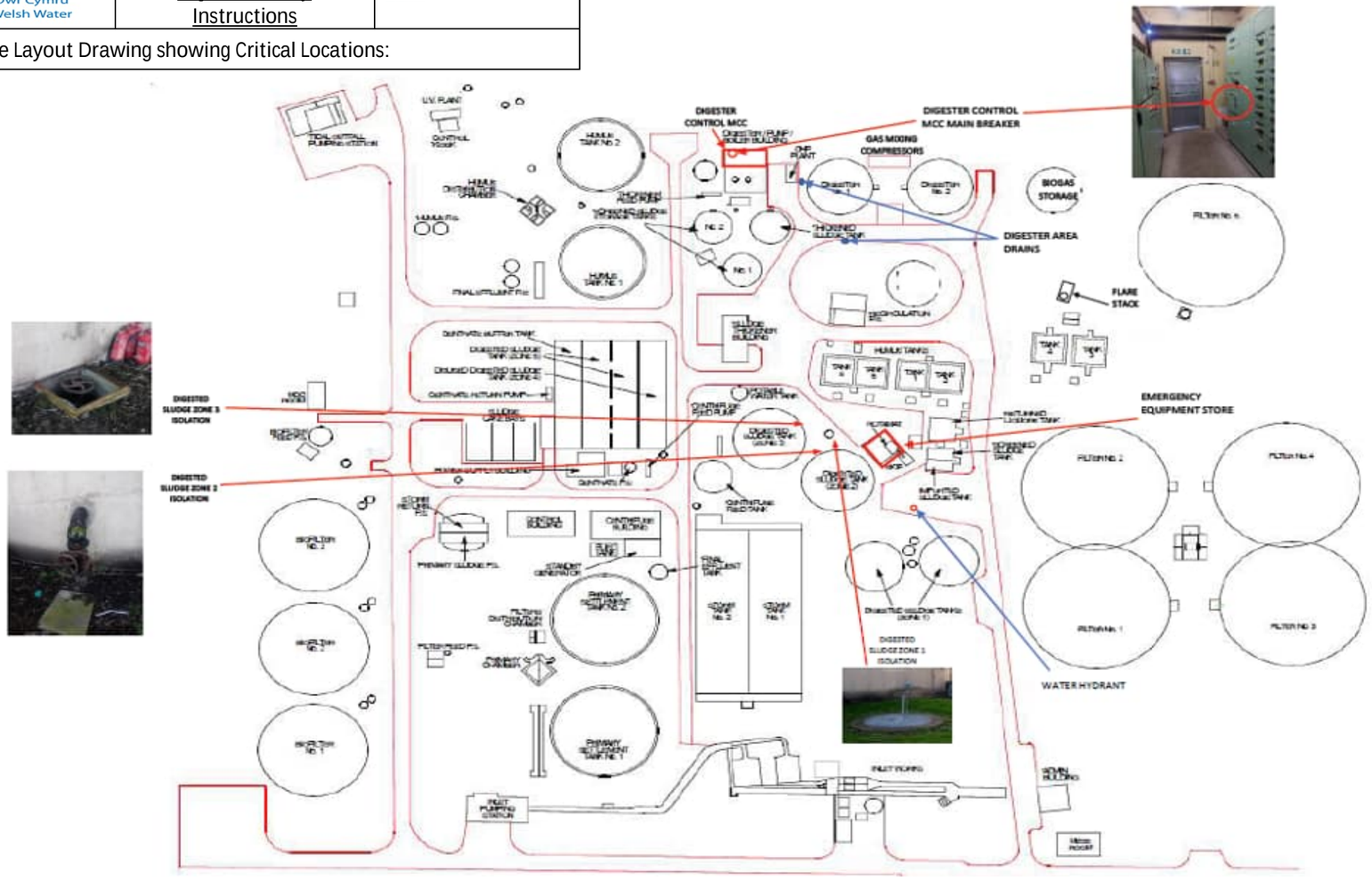
Site Layout Drawing showing Critical Locations:		



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:				

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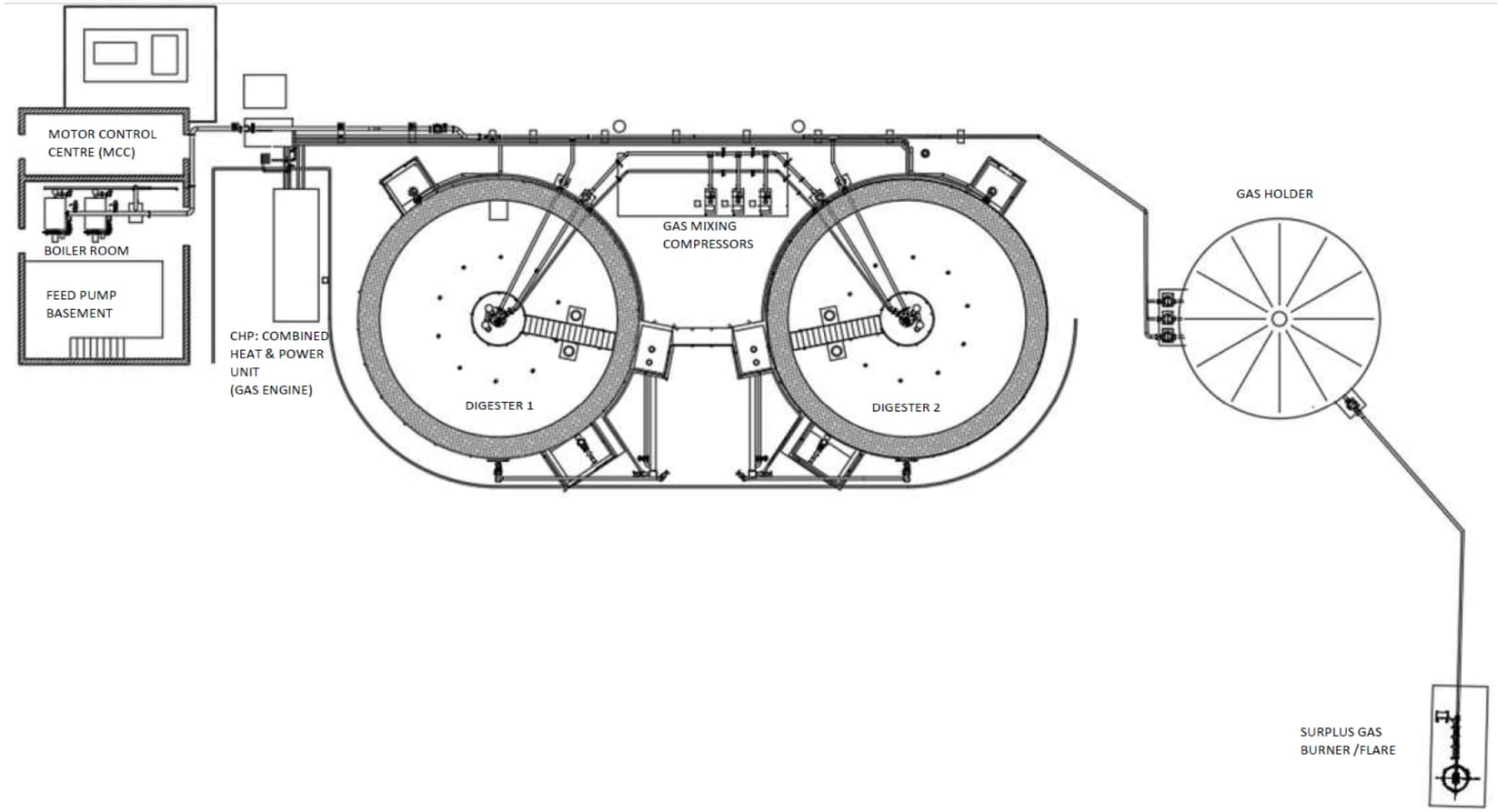

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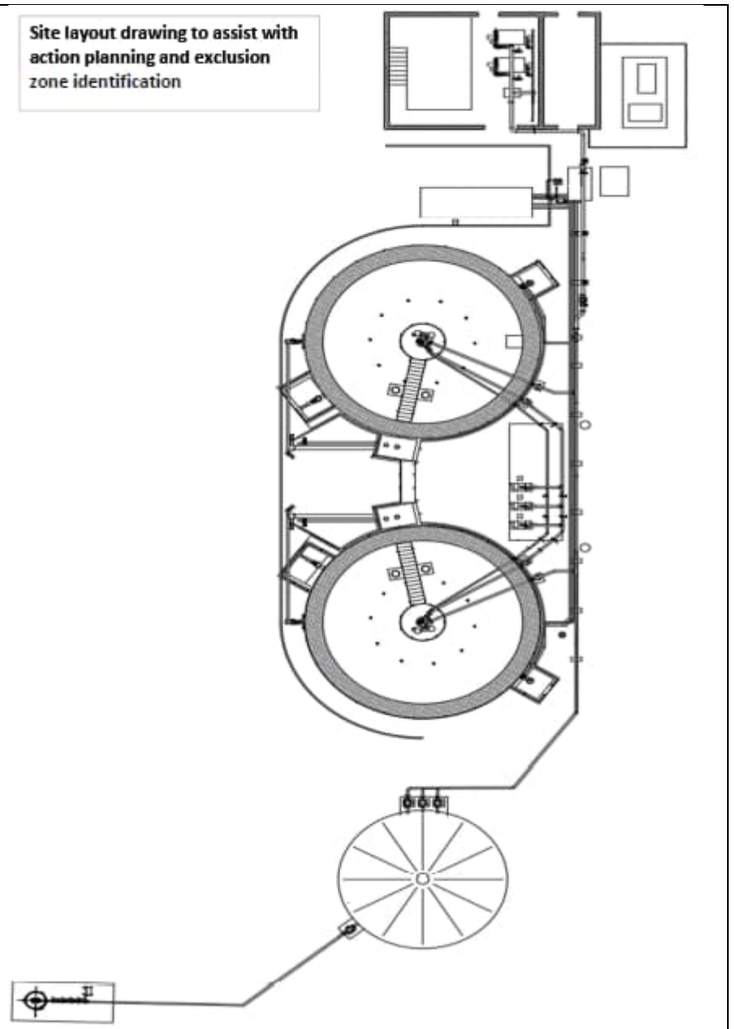
Emergency Instructions for MECHANICAL DAMAGE			
Prepare			
Evacuate:	Clear people from the area. If the damage is a vehicle strike turn off the ignition and leave the vehicle in situ. Equipment and machines to be turned off/made safe as staff leave the area.		
Assess the risk:	Is there a fire or the 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.



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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	

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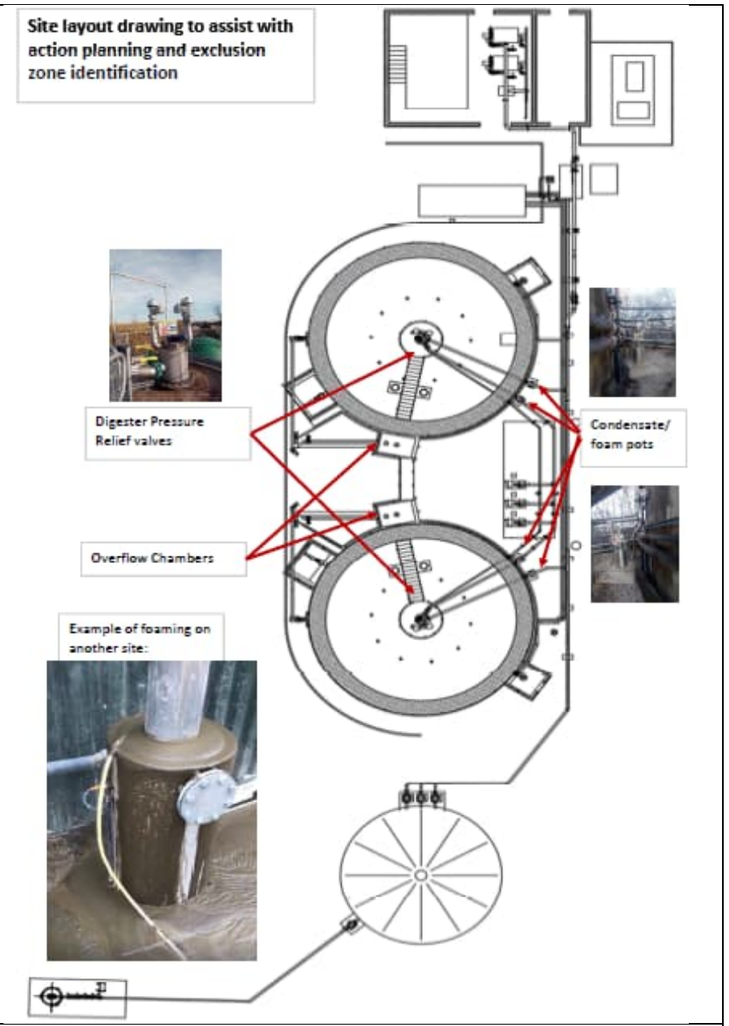
Actions: Advice:	Stop feeding both digesters. If digester has been mixing normally – mix continuously. If digesters have had long intervals between mixing – mix intermittently.
Control	
Action: Advice:	Observe digester level transmitter- if it is showing greater than 100 %, or less than 85%, prohibit 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 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.



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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: Assess the risk: Communicate: Equipment:	Gas mixing compressor area. What direction is the wind blowing in? (Approach from upwind). Alert line manager confirm wind direction and estimated duration of gas release. 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

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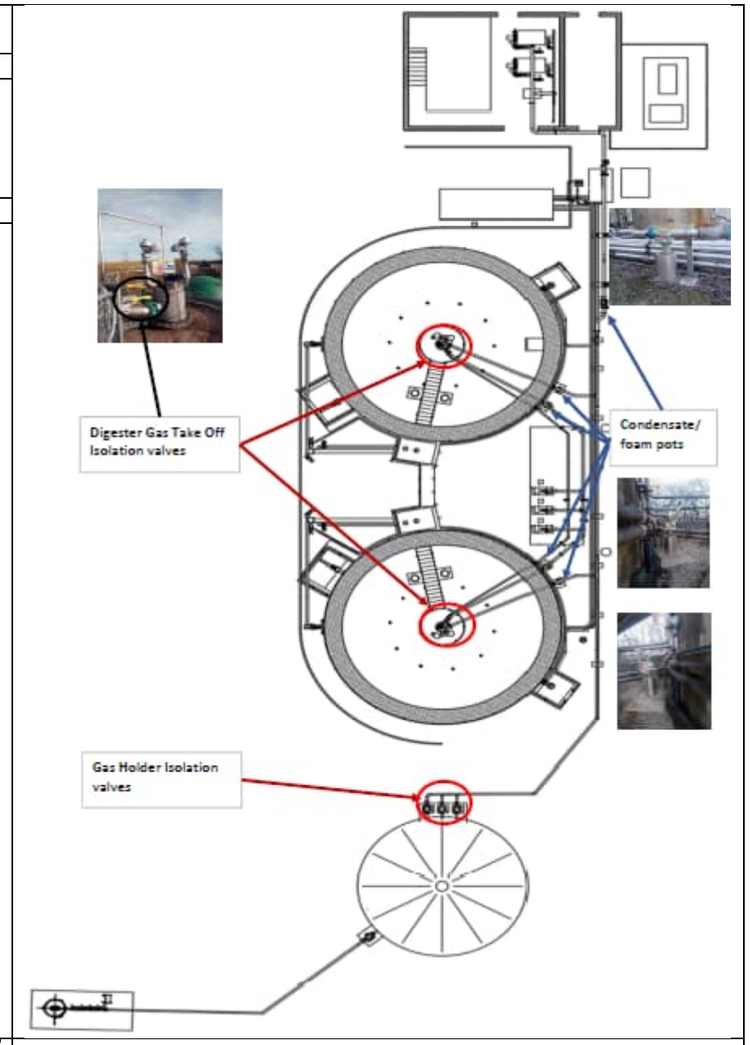
Advice:	Approach with caution as biogas may still be venting. Looks for audible and visible signs such as splashing/bubbling.
Control	
Action: Advice:	Re-fill condensate pot with water until overflow level is reached. Check all condensate pots. Open all isolation valves and confirm water seal is holding. Check for any mechanical damage.
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*



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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	

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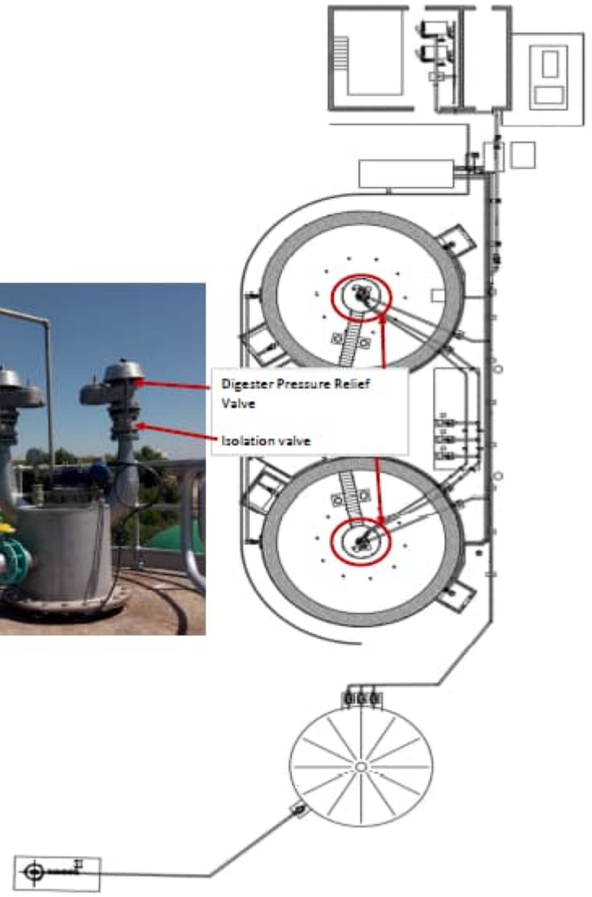
Action:		Ensure other PRV is online, then isolate leaking PRV. UNDER NO CIRCUMSTANCES MAY BOTH PRVs BE ISOLATED SIMULTANEOUSLY. Approach and operate valve from upwind	
Control			
Action: Advice:	Monitor biogas system pressure, if it drops to below 20mbar, treat as moderate.		
Consolidate			
Action:	Call statutory maintenance team and arrange for valve servicing to be brought forward.	Call statutory maintenance team and request intervention ASAP.	



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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			

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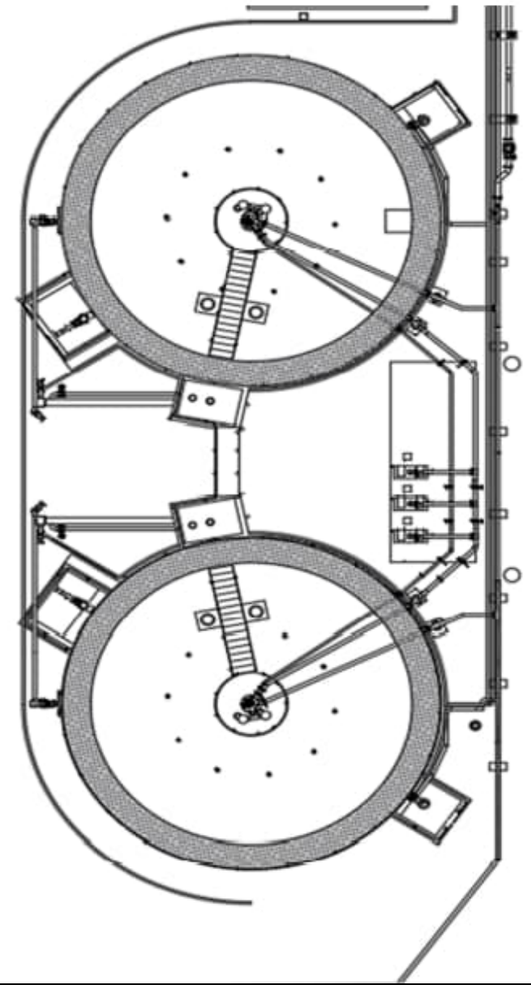
Action:	Consult specialists – may be possible to reduce severity by reducing operating pressure.		Schedule repair works.
Advice:	Caution advised on safe and effective live repairs as difficult to achieve.		
Consolidate			
Action:			
	Record leak dates and monitor any deterioration.		

Use diagram below to show approximate leak location



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Emergency Instructions for Gas Leaks from Pipes and Equipment

Classify the Emergency

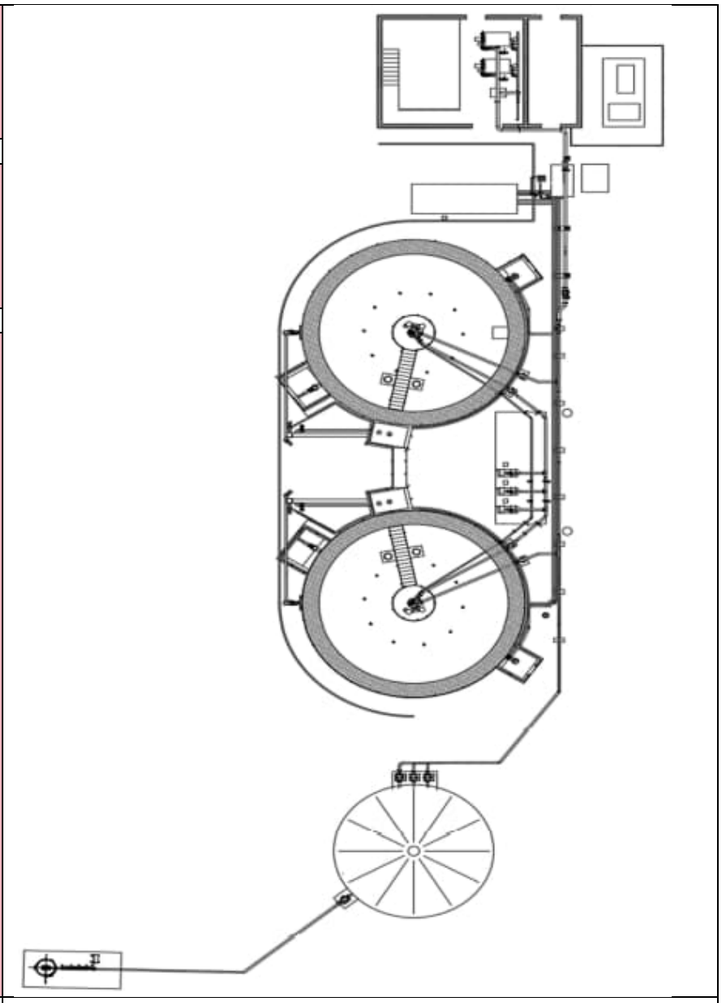
Measure:	Slight	Moderate	Severe
	Personal gas monitor alarms. Bubbles in wet weather.	Personal gas monitor alarms at 0.5 ppm	Personal gas monitor alarms at 1 ppm or greater

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.



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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.

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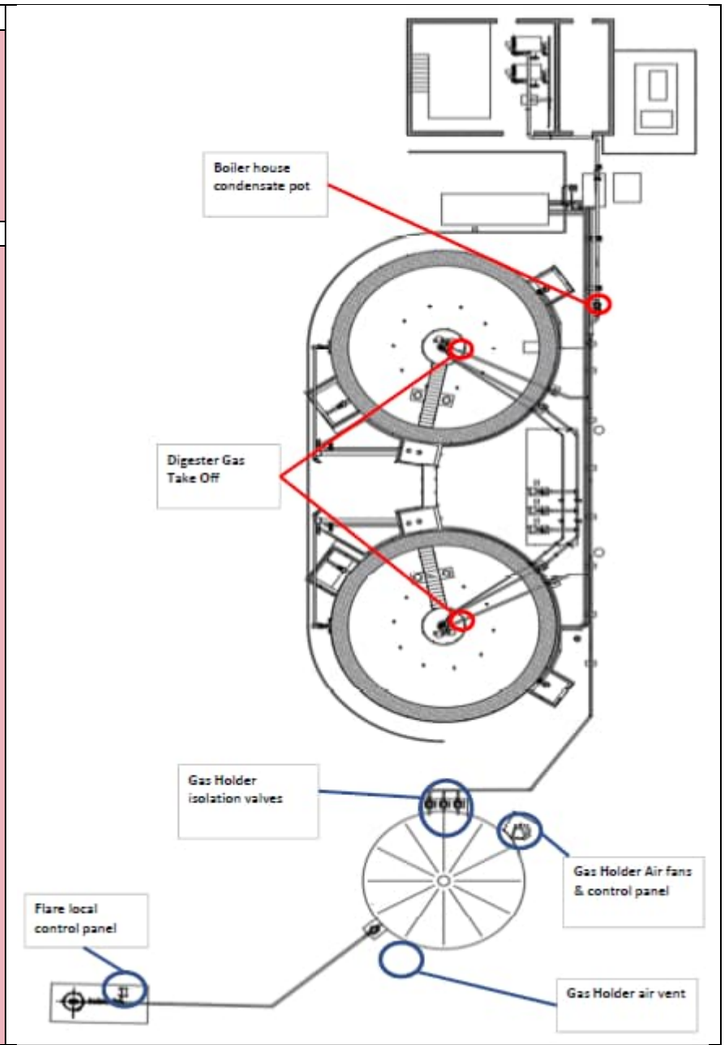
	Control		
Action:	Monitor methane in the air space of the gas holder. If it can be reduced: Adjust air vent so that working pressure (20mbar) is resumed in the gas system. Open gas holder isolation valves and resume operation. If persists treat as moderate.	Turn on the flare in hand at local panel.	Turn 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.



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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.

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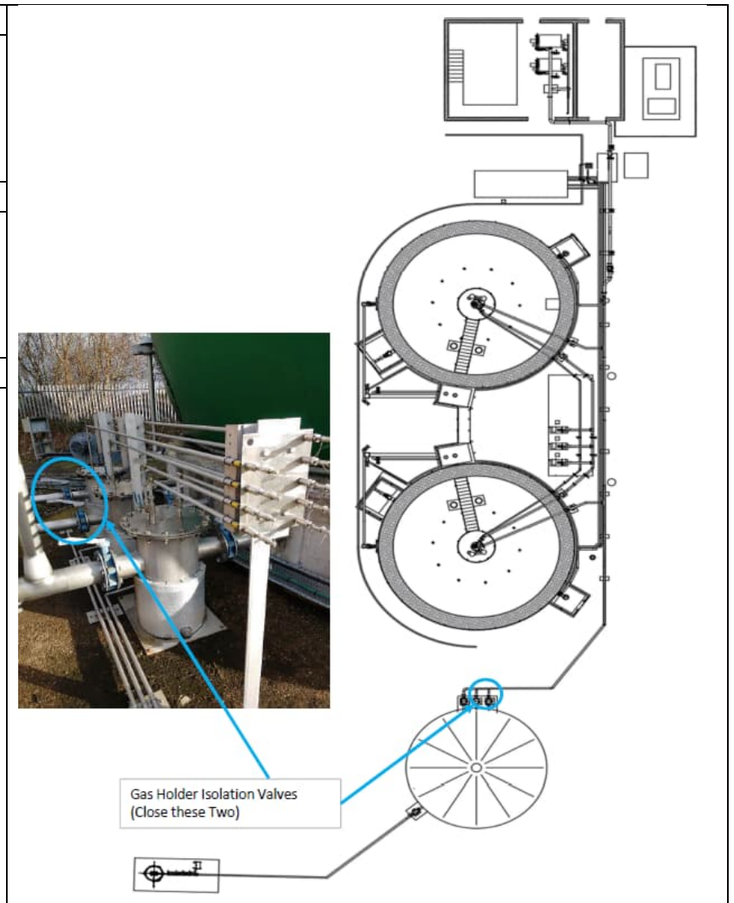
Contain	
Actions:	Isolate biogas consumer valves at gas holder. Ensure flare is in 'remote' at local panel to allow automatic control.
Advice:	
Control	
Actions:	Establish an exclusion area around boiler house, authorised access only. Allow gas within the boiler house to dissipate.
Advice:	
Consolidate	
Actions:	
Advice:	



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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	

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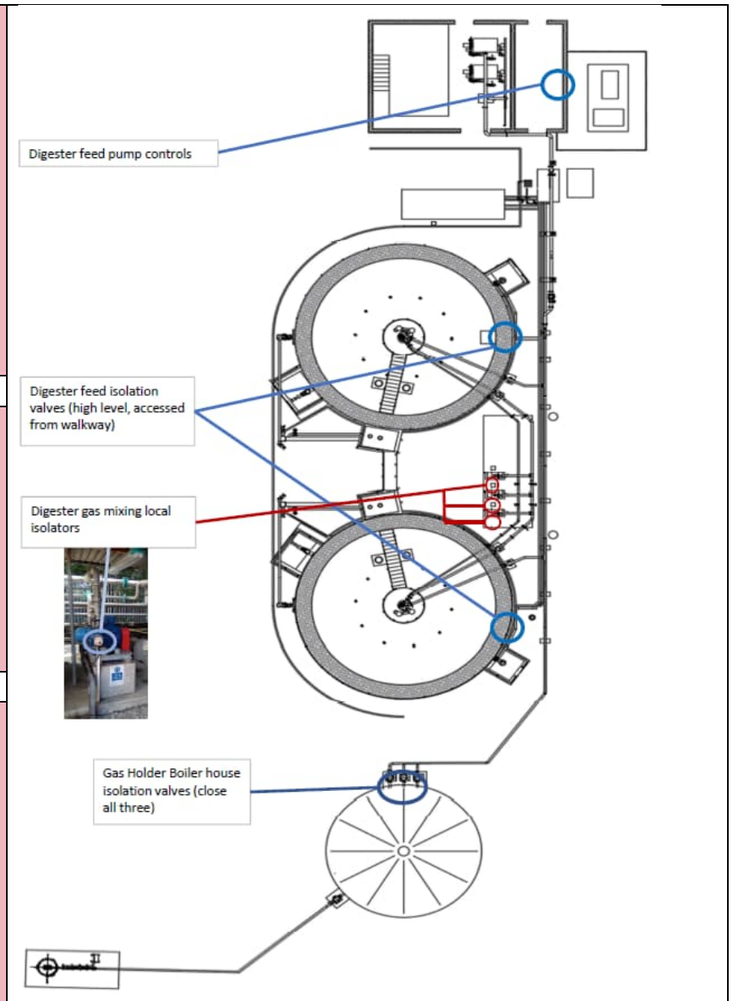
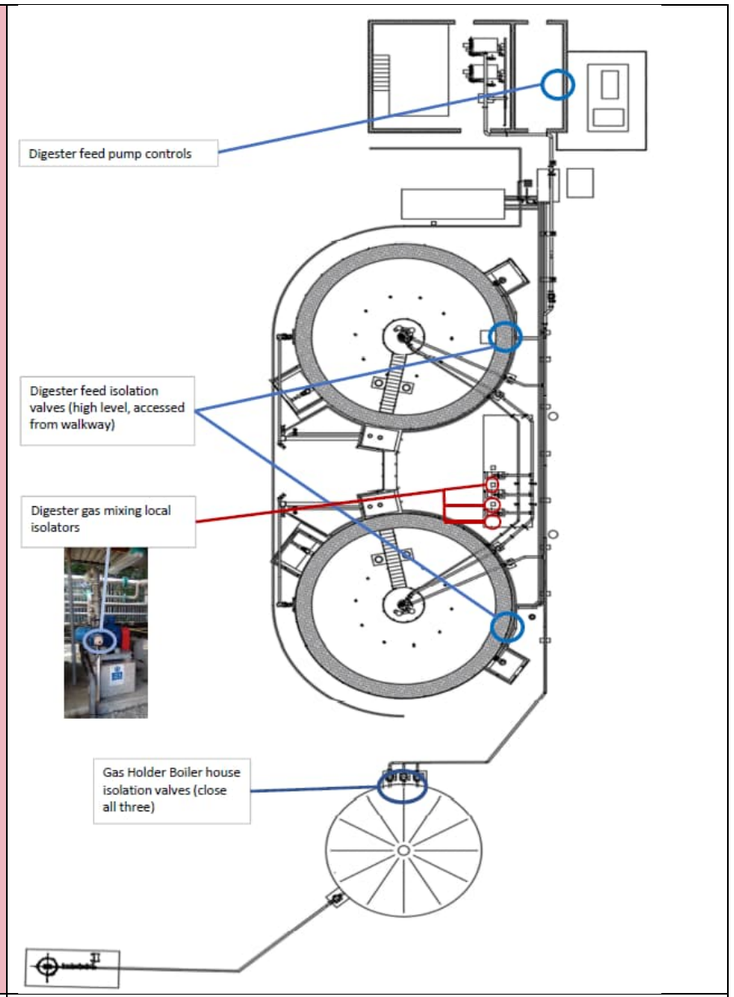
Actions	Isolate associated valves & equipment (Feed Pumps) Use manual isolations as well as actuated valves. If necessary, clean up spillage to ease biogas (H_2S) release, particularly for leaks in the basement. If personal alarm sounds, evacuate and ventilate.	Turn digester feed pumps off. Close actuated 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.	



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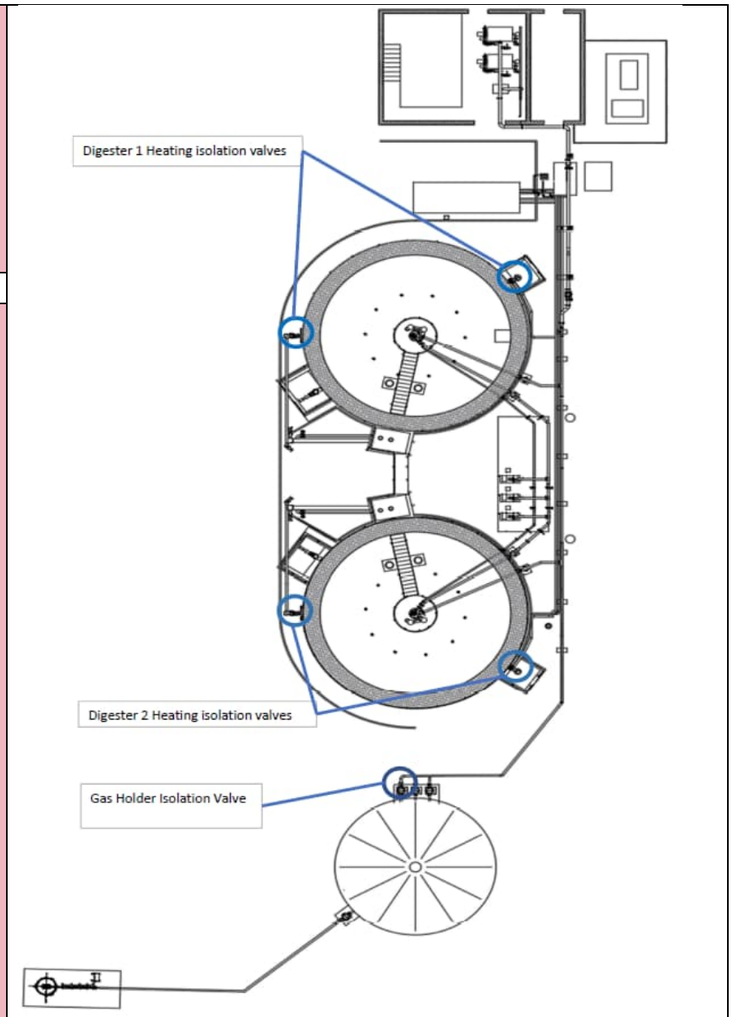
Emergency instructions for Sludge Leaks on the Digester Heating

Classify the Emergency			
Measure:	Slight	Moderate	Severe
	Leak at flange or equipment	Leak through pipe wall or pump casing	Sever pipe damage.

Prepare	
Evacuate:	Vicinity of leak
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:	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.
Equipment:	PPE, gas monitor, adjustable spanners, cones, barrier tape, spill kits, portable pumps and hoses.

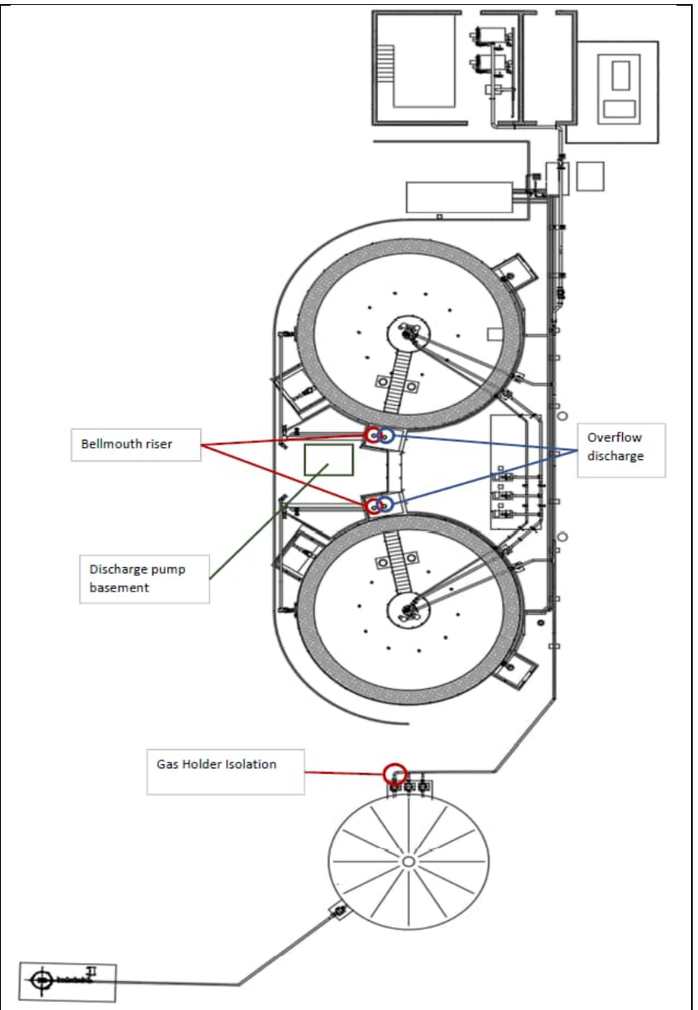
Contain

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: Advice: 	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. Stop feeding digester while heat exchanger is offline. If heating is off for extended period, consult specialists for recommissioning advice.	Confirm digester level at HMI. If it is less than 85%, restrict access to digester rooves and close gas holder isolation valves. 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.	Confirm digester level at HMI. If it is less than 85%, restrict access to digester rooves and close gas holder isolation valve. 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			
Measure:	Slight Leak from overflow chamber discharge pipe. Digester low level.	Moderate Leak in underground discharge pipes/pumps. Digester low level.	Severe Leak from riser connected to bellmouth. Digester low level.
Prepare			
Evacuate: Assess the Risk: Communicate: Equipment:	Area around & underneath overflow chambers. Ensure discharge basement is clear of people. Is the cause of the leak visible? Has the overflow chamber/pipes moved? IF SO DO NOT ENTER PITS! 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: Advice:	Inform site manager. Reduce sludge imports. Arrange for specialist to assess/repair. Repairs may take significant time and appropriate plans will need to be put in place for the duration.	Inform site manager. Reduce sludge imports. Arrange for specialist to assess/repair.	Repairs may take significant time and appropriate plans will need to be put in place for the duration.

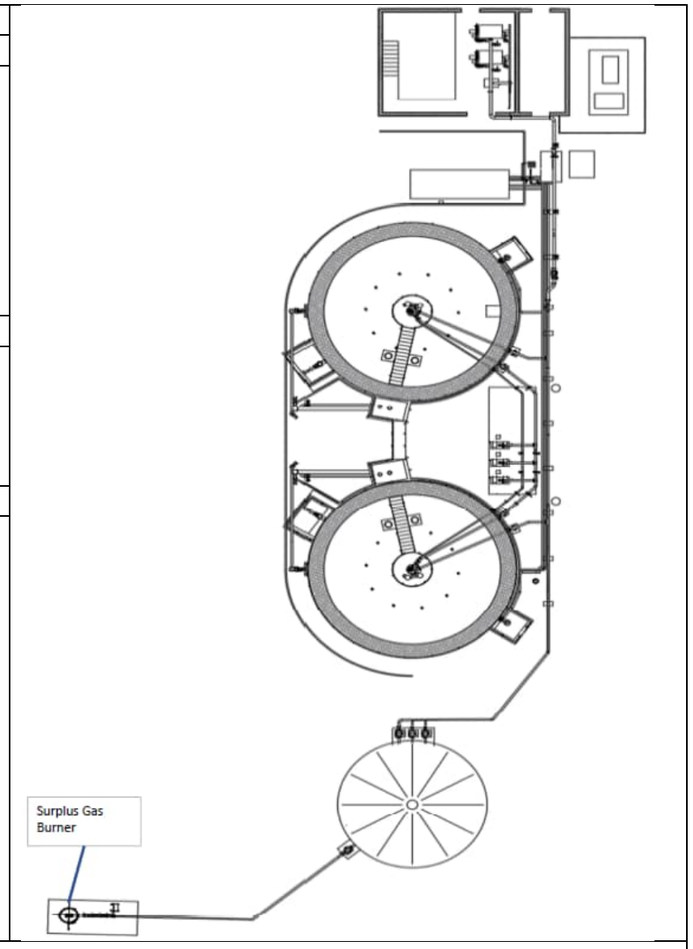


Dŵr Cymru Welsh Water	Queensferry WwTW Digester Safety Instructions	PRINCIPLE BIOGAS

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:	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.	

Mott MacDonald Restricted

Equipment:		
Contain		
Actions:	Observe Surplus Gas Burner. Report its operation to Bronze level supervisor.	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
Advice:	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	
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

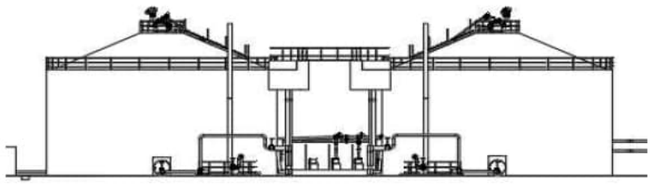
Emergency Instructions for Digester Vessel Leaks	
Classify the Emergency	
Measure	Any new leak permeating through the digester concrete or around a cast iron nozzle/door/fitting.
Prepare	
Evacuate:	Digester roof area.
Assess the risk:	Where is the leak? How big is it? Is the leak best described as a ‘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	

Mott MacDonald Restricted

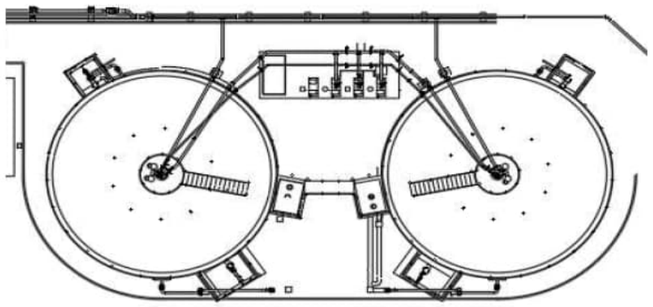
Actions:	Stop feeding the affected digester(s) Set up an exclusion zone around and beneath the leak location.
Control	
Action:	If safe and practicable, mark leak extent and monitor for expansion. If leak cannot be reached or approached, take photographs from a safe location.
Consolidate	
Action:	Call site manager and arrange for specialists to survey the digester for structural integrity.

Use the drawings below to show the leak location

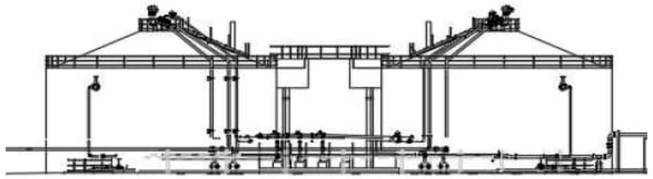
FRONT (ROAD SIDE) VIEW OF DIGESTERS



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.

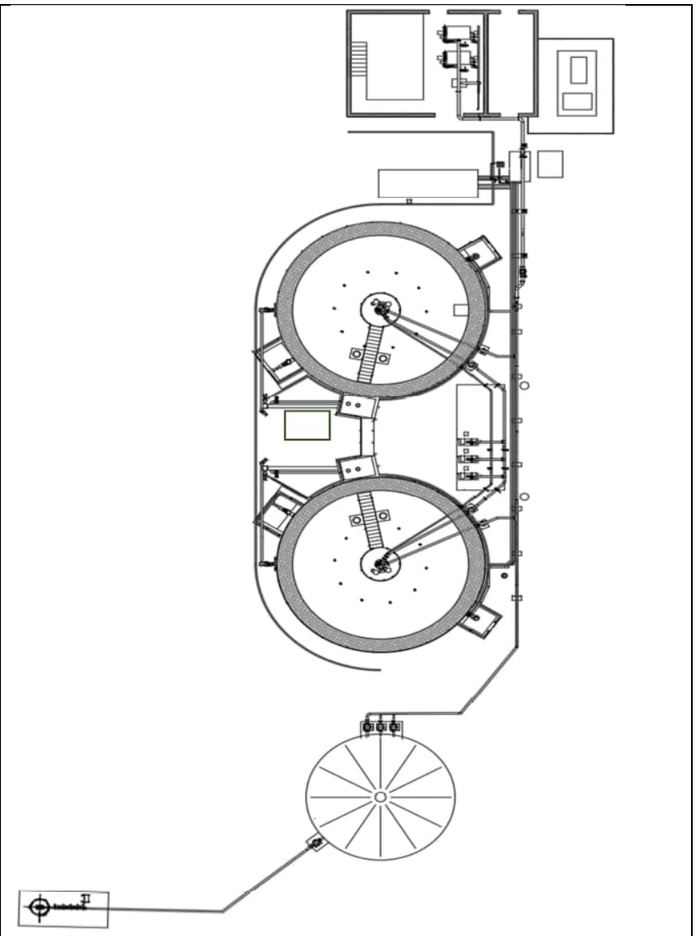
Incident Details:

Actions Taken:

Mott MacDonald Restricted

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?

E. Fire Risk Assessment

FRA01	Site name and function	Date of previous FRA
	Asset No 00932	Oct 2019
Assessment carried out by: J. Coker & S. Ridley		Issued: 11 Jan 2023

Index

Part 1 General Information
Part 2: Fire hazards and elimination or control
Part 3 Provision of Elements of Fire Safety as Secondary Control Measures
Part 4 Training, records, maintenance records and procedures
Part 5 Actions

Part 1: GENERAL INFORMATION

The responsible person for fire safety

Name of the responsible person	**Michaella Thompson**
Contact details of responsible person	Mobile: 07827873729

This assessment is to be **reviewed on or before 12 calendar months** of the date of assessment. Where there have been no significant changes, reviews of FRA01 will be undertaken by the Competent Person (Fire Safety) annually using form **FRA04** Fire Risk Assessment Revision Sheet. In the annual review, if the Competent Person (Fire Safety) identifies significant changes to the site, a renewal of the FRA01 is requested by email to the Statutory Maintenance Team, contact: Statutory.maintenance@dwrcymru.com

This FRA 01 will be renewed every 3 years.

Reviewed by:			
Date of review:			
Reason for review:			
Responsible person:			

The purpose of this report is to provide an assessment of the risk to life from fire in these premises, and, where appropriate, to make recommendations to ensure compliance with fire safety legislation. The report does not address the risk to property or business continuity from fire.

Persons consulted	**Frank Esposito** - Wastewater Senior Process Operator – 07771353195 **Lydia Hughes** - Operational Coordinator - 07771352594
Summary	Queensferry WWTW and Aerobic Digestion Facility is located in Deeside NE Wales. The WWTW receives flows of crude effluent through a number of sewers. Indigenous and Imported sludge is treated at the Mesophilic Anaerobic Digestion (MAD) site. The site is manned on a daily basis, normal hours for Ops are 08:00 - 16:00 and for Ops, ME&I and other support staff. Cake and tanker lorries can access site by using the electronic gate pass. The site consists of the digesters and associated plant and equipment, gas holder, waste gas burner, main office block, mess building, digester MCC and boiler/pump house, centrifuge/generator building, control building, sludge thickener building, tidal outfall Pumping Station (PS), old workshop and many unmanned MCC buildings and PS. Biogas produced by the digestion process is stored in the gas holder (500m^3) and is used in boilers which can also run on diesel which is held in tanks next to the boiler house. Excess biogas produced is flared off via a flue stack.

	A summary of significant buildings is given below in the main body of this assessment along with observations, proposed actions and photographs. There are items that need addressing regarding the fire safety arrangements on site. Following this assessment there are actions for the responsible person to implement or mitigate and record these measures on the actions section of this document.

Risk rating classification of building	**Normal**
Where the likelihood of the outbreak of fire and consequent spread is very remote, coupled with an absence of flammable or explosive materials	Low
Where the likelihood of the outbreak of fire is unlikely to spread at speed and there is little risk of any part of the building fabric igniting easily.	Normal
Where the volume of materials present (being stored or used) would ignite readily causing rapid fire spread and the production of large quantities of toxic fumes. Where an area is designated as a high risk due to its function or the ability of its occupants.	High

1 The Site	
Significant buildings: Occupancy, Construction & Floor area (M^2).	**Office building:** is a detached, two storey, traditionally constructed of brick/concrete, under flat roof. The building measures approximately 8m x 6m with an approximate footprint of 48m^2. The ground floor consists of storage area; first floor office, control room, toilet and kitchenette. Access/egress is via an external staircase.
	Mess: is a detached, single storey, constructed of brick/concrete with a flat roof. Access/egress is at the front of the building. The building measures approximately 10m x 7m with an approximate footprint of 70m^2. The building contains mess with cooking facilities, control room, stores, toilets and shower room.
	Boiler house; is a detached, normally unmanned, single-storey with lower level in the boiler area housing pumps. Steel framed, and brick, block and concrete construction with a flat roof. Separate access to the MCC room and separate access to boiler room. There are alternative means of escape from both rooms. The building measures approximately 12m x 10m with an approximate footprint of 120m^2. There is a fire alarm system, gas alarm system, emergency lighting and manual call points.
	Centrifuge building: is a single-storey, steel framed, and brick, block and concrete construction with a flat roof. consisting of centrifuge area (17m x 7m approximate footprint of 120m^2) and standby generator room (6m x 8m approximate footprint of 120m^2). The main access/egress entrance is at the side of the centrifuge building with alternative means of escape doors provided and wicket doors on the roller shutters. A fire exit is in the generator room but enters a secure compound where a key is required to exit to a safe area. There is automatic fire detection, fire extinguishers and emergency lighting.
	Sludge thickener building: is a detached, unmanned, single-storey, constructed of block/concrete with steel panel walls under a metal sheeting pitched roof. The main access/egress entrance is at the front elevation of the building along with a roller shutter door. The building measures approximately 13m x 6 m with an approximate footprint of 80m^2. There is emergency lighting and fire extinguishers in the building. There is no automatic fire/smoke alarm system fitted**.**
	Control building; is a single-storey, steel framed, and brick, block and concrete construction with a flat roof with an approximate area of 90m^2 (15m x 6m). The building houses the MCCs. There is an automatic fire detection with the control panel, intruder alarm, emergency lighting, fire extinguishers and alternative final exits to the building.
	Tidal outflow pumping station; is a detached, single storey, constructed of brick, block and concrete with a pitched slate roof. Access/egress is at the front of the building and it measures approximately 6m x 6m with an approximate footprint of

	36m^2. The building houses MCCs and is used as a store, workshop and mess area. There is emergency lighting and fire extinguishers in the building.	
	MCCs; Various unmanned pumping stations and MCC buildings with single entrance/exit, some with alternative exits.	
Comment:		
2 The occupants		
2.1 Maximum number of occupants:	Normally one operator but could be more - Ops and ME&I 5 DCWW. Tanker and cake lorry drivers.	
2.2 Maximum number of employees at any given time:	Day	Normally 1 operator but could have more DCWW staff on site 08:00 - 16:00, ME&I, Science & support
	Night	Call outs if alarm raised when Ops and ME&I could be on site. Cake lorries export (24hrs) and import (06:00 – 18:00)
2.3 Maximum number of contractors:	Various - Cake lorries export (24hrs) and import (06:00 – 18:00) attend site plus construction/maintenance contractors.	
2.4 Maximum members of public:	Nil. If members of the public are on site it will be on accompanied site tours and will be risk assessed.	
2.5 Associated times/hours of occupation:	Site normally occupied 08:00 – 16:00 by Ops. Cake lorries and tankers attend site using electronic access. See above.	
2.6 Comment:		

3 Occupants at special risk		
Question	Response	Details/comments/numbers
3.1 Are vulnerable persons at the premises?	No	
3.2 Are there sleeping occupants?	No	
3.3 Are there disabled occupants?	No	There are no disabled members of staff or any other person on site who will require assistance in an emergency.
3.4 Are there occupants in remote areas?	No	Not on a routine basis. Some Blackline G7c Safety Devices are used onsite but staff will log on to lone working if they have not been issued with Blackline G7c Safety Device.
3.5 Are there lone workers?	Yes	Some operators have Blackline G7c Safety Devices and these are used onsite, the operator will log on to lone working if they have not been issued with Blackline G7c Safety Device.
3.6 Comment:		

4 Previous Fire loss experience		
Question	Response	Details/comments/numbers
4.1 Is there any previous history of fire loss in the premises? (If yes give details)	No	Smoke from belt slip due to wear in centrifuge building.
4.2 Comment:		

5 Other relevant background		
Question	Response	Details/comments/numbers
5.1 Has a **previous** FRA 01 been completed for the site and if so, what is the date of issue?	Yes	Previous FRA 02s Oct 2019 and Apr 2019 no name for assessor. FRA 01 Completed on 03/11/2016, 14:03 no name of company who carried out assessment - Delyn Safety?
5.2 Have the actions in the **previous** FRA 01 been	No	Many of the actions in previous FRA 01 03/11/2016 have not been completed.

<table>
<tr><td>completed or mitigation in place?</td><td></td><td>The completed or mitigated required actions could not be found on the previous FRA. Completed action sheet with persons responsible, dates closed down and mitigation, if not carried out. Update FRA and keep with fire logbook somewhere accessible so it can be shown to the enforcing authority when demanded.</td></tr>
<tr><td>5.3 Has the previous FRA 01 been reviewed?</td><td>No</td><td>Review required to be carried out every year. Previous FRA 04 found carried out June 19.
<table>
<tr><td></td><td>Name</td><td>Role</td><td>Date</td></tr>
<tr><td>Revision carried out by:</td><td>Lydia Edwards</td><td>Ops Co-ordinator</td><td>June 19</td></tr>
<tr><td>Approved by:</td><td>Michaella Thompsin</td><td>Manager</td><td>June 19</td></tr>
<tr><td colspan="4">Once this revision sheet is completed and signed please scan and append to report.</td></tr>
</table>
<table>
<tr><td>Issue 2.0</td><td>19/08/16</td><td></td></tr>
</table>
</td></tr>
<tr><td>5.4 Are there any residential properties in or attached to the building?</td><td>No</td><td></td></tr>
<tr><td>5.5 Is there a prohibition notice in force? (if yes give date of issue)</td><td>No</td><td></td></tr>
<tr><td>5.6 Is there an alteration notice in force? (if yes give date of issue)</td><td>No</td><td></td></tr>
<tr><td>5.7 Is there an enforcement notice in force? (if yes give date of issue and date of when work is to be completed by)</td><td>No</td><td></td></tr>
<tr><td colspan="3">5.8 Comment:</td></tr>
<tr><td colspan="3">6 Relevant Fire Safety Legislation</td></tr>
<tr><td>6.1 The following fire safety legislation applies to these premises:</td><td colspan="2">The Regulatory Reform (Fire Safety) Order 2005, The Gas Safety (Installation and Use) Regulations 1998, The Furniture and Furnishings (Fire) (Safety) Regulations 1988 (as amended in 1989, 1993 and 2010), Health and Safety (Safety Signs and Signals) Regulations 1996,</td></tr>
<tr><td>6.2 The above legislation is enforced by:</td><td colspan="2">North Wales Fire and Rescue Service</td></tr>
<tr><td>6.3 Other legislation that makes significant requirements for fire precautions in these premises (other than the Building Regulations 2006):</td><td colspan="2">Health and Safety at Work etc. Act 1974, Management of Health and Safety at Work Regulations 1999, The Dangerous Substances and Explosive Atmosphere Regulations 2002 (DSEAR), The Control of Substances Hazardous to Health Regulations 2002, The Electricity at Work Regulations 1989, Confined Spaces Regulations 1997, Water Resources (Control of Pollution) (Oil Storage)(Wales) Regulations 2016, Construction (Design and Management) Regulations 2015, Building Regulations 2000, Equality Act 2010</td></tr>
<tr><td>6.4 The above referenced legislation is enforced by:</td><td colspan="2">The HSE and Local Authority.</td></tr>
<tr><td colspan="3">6.5 Comments:</td></tr>
</table>

Part 2: FIRE HAZARDS AND ELIMINATION OR CONTROL		
Sources of ignition		
7 Electrical sources of ignition		
Question	Response	Details/comments/numbers
7.1 Are reasonable measures taken to prevent fires of electrical origin?	No	See below. Some equipment out of date for Portable Appliance Testing (PAT). ATEX equipment within zoned areas are under a maintenance and inspection scheme employing suitable and competent contractors. Annual – visual; 3 yearly – Intermediate, 10% of equipment inspected; 5 yearly - intrusive. Include on induction the need for electrical safety procedures to be followed on site. Electrical equipment to be PAT and unused equipment turned off.
7.2 Is the fixed wiring installation periodically tested and inspected?	Yes	December 2018/Jan 2019, held on the Infozone EICR click on link for reports. Due 2023
7.3 Are portable appliances inspected, tested and recorded?	No	Most observed equipment on site had PAT, there were pieces of equipment stored in areas without e.g. equipment in tidal overflow PS, Air conditioners in UV MCC, photocopier in office etc. Remove if not required or carry out PAT. Include on induction that portable appliances require testing and be in good condition
7.4 Is there a suitable policy about the use of personal electrical appliances?	Yes	Electrical safety procedures are in place and held on Source. Include on induction that some personal electrical appliances may not be charged on DCWW sites or permitted items require testing and be in good condition.
7.5 Is there a suitable limitation on the use of trailing leads and adapters?	No	If used ensure leads are unrolled to prevent extension leads overheating and do not overload. Consult electrical specialist over UV building extension lead electrical loading.
7.6 Is non-essential equipment switched off/disconnected over night?	No	Various equipment left on. Brief staff that equipment to be turned off when not required and that some personal electrical appliances may not be charged on DCWW sites e.g. e-cigarettes. Include on induction.
7.7 Is Luminous Discharge Lighting installed? (if yes does the installation meet with current standards)	Yes	Fluorescent lighting.
7.8 Are there other sources of High Voltage?	Yes	The electricity supply to the works enters at the Power Supply Building. It is a single supply rated at 500kVA. Access internally or externally only by authorised persons. The Standby Diesel Generator is located in a dedicated room attached to the Centrifuge Building and adjacent to the Bulk Storage Diesel Tank. It is rated at 700 kVA. In the event of a mains failure the Generator will start and its automatic circuit breaker will close. The Generator is of a sufficient capacity to power all processes on site in the event of a mains supply failure. The Bulk Storage Tank has a capacity of 33,000 litres, and gravity feeds to a Day Tank adjacent to the Generator.

7.9 What happens to the HV electrical supply in the event of fire within the building?		Power supplier has to isolate. Dial 105 to contact Western Power. Include on Emergency procedures. Senior Authorised Person (SAP) HV will be contacted and Bronze standby.
7.10 Comment: Remove unwanted/damaged electrical equipment from site. Critical sections of the plant are equipped with Uninterruptible Power Supply (UPS). In the event of loss of power the works site has UPS facility serving the SCADA System and is designed to support it for approx. 1 hour.		
8 Smoking		
Question	Response	Details/comments/numbers
8.1 Are reasonable measures taken to prevent fires as a result of smoking?	Yes	In accordance with the Smoke-free (Premises and Enforcement) Regulations 2006 the Company smoke free policy states: Smoking is prohibited in all DCWW on premises, or around on the grounds where visitors or colleagues may be impacted by smokers or smokers congregating which could damage the company image. Smoking is only permitted in the designated smoking areas. Smokers are required to comply with the **Environmental Protection Act 1990.** Therefore, littering offences, such as dropping cigarette ends are also coved under this policy. E-cigarettes are classed as non-work related electric devices. DCWW prohibit the charging of e-cigarettes on DCWW premises for electrical safety purposes.
8.2 Is smoking prohibited in the building?	Yes	In accordance with the Smoke-free (Premises and Enforcement) Regulations 2006. Smoking is prohibited including electronic cigarettes throughout all of DCWW premises with the exception of identified external smoking areas such as outdoor smoking shelters. See Company smoke free policy and Smoke free FAQs.
8.3 Is smoking permitted in appropriate areas?	Yes	Currently two dedicated smoking points, one is outside the Mess Building for DCWW staff and the other, for contractors is in the contractors compound. Include this information on induction **.**
8.4 Are there suitable arrangements made for those who wish to smoke?	No	Informed that site was a no smoking area but smoking took place. Enforce no smoking or provide ashtray or container for cigarettes. Consider having the dedicated smoking area away from the building entrance/exit as personnel using this entrance /exit will have to pass through smoke or the entrance may be used as a shelter.
8.5 Is there any evidence of breaches of smoking policy?	Yes	Cigarette ends found around outside table on the ground. Enforce no smoking or provide dedicated smoking area and ashtray or container for cigarettes.
8.6 Is the appropriate smoking prohibition notice displayed at the building's entrance?	Yes	
8.7 Comment:		
9 Arson		
Question	Response	Details/comments/numbers
9.1 Does the basic security against arson appear reasonable?	No	A number of break-ins and intruders have occurred and items have been stolen but no indication of attempted arson. WOM states: An Intruder Alarm is installed in all major buildings:- • the Control Building (Main Panel Room) • Boiler House & Control Room

		• Admin Office • Mess Room It is activated/deactivated by keypad entry. **The intruder alarm has not been commissioned.** All other buildings within the site are locked and are under permanent surveillance by CCTV which is installed across the site. The perimeter of the site is protected with metal palisade fencing and access to the site is by means of an electronic steel gate, which is monitored by staff of the treatment works. All enclosed areas are securely locked when not in use. The mess room windows and access door are fitted with steel security grilles. Some areas of the site have high security fencing and razor wire e.g. fuel tanks.
9.2 Is there sufficient control of unnecessary fire load in close proximity to the building or available for ignition by outsiders?	Yes	Some areas of the site have high security fencing and razor wire e.g. fuel tanks.
9.3 Comment:		
10 Portable heaters and heating installations		
Question	Response	Details/comments/numbers
10.1 Is the use of portable heaters avoided as far as reasonably practicable?	Yes	Fixed electrical heaters on site. Portable air conditioning in use. Two air conditioners and fan are being run off a single extension lead. Consult electrical technician to ensure this is not overloaded. Investigate if ventilation is appropriate for this area.
10.2 If portable heaters are used, are the more hazardous types (radiant bars and LPG) avoided?	Yes	
10.3 If portable heaters are used are suitable measures taken to minimise the risk of ignition of combustible materials?	Yes	
10.4 Are fixed heating installations such as boilers used within the premises?	Yes	Digester boilers on site but not used to heat buildings. Fixed electrical heating and portable air conditioning – see above.
10.5 Are fixed heating installations subject to regular maintenance?	Yes	EICR and boiler inspection 28 and 29th/01/2021 for records click here. Waste gas burner 29/07/2021 for records click here.
10.6 Does the storage system comply with the Control of Pollution (Oil Storage) (England) Regulations 2001 and the Control of Pollution (Oil Storage) (Wales) Regulations 2016?	No	Diesel fuel is used to power the standby generator also gas oil for boilers. The 33,000litre bulk storage tank for the standby generator is located adjacent to the centrifuge building and generator room. Gas oil storage tank adjacent to digesters for the dual fuel digester boilers (tank capacities of 4377Ltrs & 2216Ltrs (from previous FRA)). Notification of site information should be sought from the H&S department due to amounts of substance held on site.

		Stand by generator diesel storage tank has not got an isolating valve e.g. trigger nozzle, on the diesel delivery flexible pipe. The Water Resources (Control of Pollution) (Oil Storage) (Wales) Regulations 2016 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. For one tank, mobile bowser or Intermediate Bulk Container (IBC), the secondary containment must be able to hold 110 per cent of the volume that the container can hold. For one storage drum you can store it on a drip tray. The drip tray must be able to hold 25 per cent of the drum's total volume – not 25 per cent of the amount of oil the drum has in it. **Ideally you should use a trigger nozzle with an automatic shut off system similar to those used at petrol filling-stations.** **If you have a trigger nozzle without an automatic shutoff, it must not be capable of being fixed in the open position.** **Nozzles with lever shut-off valves must not be used, they do not comply with these regulations.** Regulation 6 (10) Paragraphs (11) and (12) apply where oil from the tank is delivered through a flexible pipe which is permanently attached to the tank or a delivery pump. (11) The flexible pipe must be fitted with a tap or valve at the delivery end which— (a) closes automatically when not in use; and (b) is not capable of being fixed in the open position (unless the pipe is fitted with an automatic shut-off device). (12) The flexible pipe must either— (a) be enclosed in a secure cabinet which is locked shut when not in use and is equipped with a drip tray; or (b) have a lockable valve where it leaves the container which is locked shut when not in use, and be kept within the secondary containment system when not in use. Old oil cans/drums in old digester control room require removal or bunding.
10.7 Are carbon monoxide detectors present in required environments?	No	Boiler building. When using gas or oil, there is a risk of poisoning with carbon monoxide (CO), which is a colourless, odourless and tasteless gas. This risk increases when the equipment is not installed, used, maintained properly or with insufficient ventilation. Employees must be instructed in; knowing alarms, the meaning of the alarm and what to do on hearing the alarm and to recognize the symptoms of CO poisoning. The first signs of CO exposure are headache and fatigue. Increased exposure can rapidly lead to loss of consciousness, arrested breathing, heart failure and death. Consider fitting a CO detector in the boiler room.
10.8 Comment:		

11 Cooking facilities		
Question	Response	Details/comments/numbers
11.1 Are reasonable measures taken to prevent cooking fires?	Yes	Mess building: hotplate, oven, kettle and microwave oven. No combustibles nearby.
11.2 Are suitable extinguishers available (e.g. Fire blanket, Wet Chemical etc.)?	No	Fire extinguisher in mess building missing and fire blanket requires wall mounting in a suitable position.
11.3 Are filters changed and ductwork cleaned regularly?	N/A	
11.4 Is an appropriate cleaning certificate available for the cleaning and maintenance of the extraction system?	N/A	
11.5 Is an appropriate suppression system used and maintained under BS EN 16282-7. Equipment for commercial kitchens. Components for ventilation in commercial kitchens. Part 7. Installation and use of fixed fire suppression systems where required?	N/A	
11.6 Is an appropriate Gas Safe Certificate available for gas cooking appliances?	N/A	
11.7 Suitable Shut Down Procedures in place for the event of fire and is this documented and practised?	N/A	
11.8 Comment:		
12 Welding/cutting/grinding		
Question	Response	Details/comments/numbers
12.1 Is welding /cutting / grinding carried out on site?	No	Welding bay on site but not used. Remove not required old equipment from site to prevent any unauthorised personnel carrying out welding. Any welding on site carried out by contractors.
12.2 Is the area where this is carried out suitable for this activity?	No	Area is full of waste equipment and oils. Site staff state that no welding takes place here. Any welding on site carried out by contractors. If possible, welding is carried out off site. If not possible, working area to be covered by hot work permit.
12.3 Are hot work permits used?	Yes	As required in accordance with Permit to Work Procedure HSP 102, issued by Authorised Persons (Permits) (AP(P)).

12.4 Is the equipment being used maintained and in good condition?	No	Welding bay on site but not used. Remove not required old equipment from site to prevent any unauthorised personnel carrying out welding. Any welding on site carried out by contractors.
12.5 Are personnel trained to use, identify faults and know what to do when defects found?	N/A	Any welding on site carried out by contractors.
12.6 Are fire extinguishing facilities suitable and personnel trained?	Yes	Health and Safety team state training requirement is completion of fire awareness eLearning. Personnel have eLearning for fire. Risk assessment covering the hot work being carried out will ascertain the types of extinguisher to be deployed.
12.7 Comment:		
13 Lightning Protection System (LPS)		
Question	Response	Details/comments/numbers
13.1 Does the building have LPS?	Yes	Lightning protection just been upgraded to Blanket Protection Oct/Nov 2020.
13.2 If yes has it been tested and are records of testing kept (**BS EN 62305-3:2011 (E) E.7 Maintenance and inspection of the LPS**)?	No	From Master Digester Maintenance 2020 - Next inspection/service due Oct/Nov 2021 TBC**.** No evidence to suggest this. Complete records should be kept of all maintenance procedures and should include corrective actions taken or required. Testing of LPS requires to be carried out in accordance with DCWW procedures
13.3 Comment:		
14 Other significant ignition sources that warrant consideration including process hazards that impact on general fire precautions		
List other ignition sources:	Vehicles, JCB bucket loader. Regular maintenance carried out.	
	Mechanical equipment (friction). Regular maintenance carried out.	
	Waste gas burner - regular maintenance carried out.	
Sources of fuel		
15 Housekeeping		
Question	Response	Details/comments/numbers
15.1 Is the standard of housekeeping adequate?	Yes	Workshop with welding equipment
15.2 Are combustible and hazardous materials separated from ignition sources? E.g. drying rooms	Yes	
15.3 Are combustible and hazardous materials stored appropriately?	No	Old oils not stored correctly e.g. welding bay.
15.4 Is the accumulation of combustible waste avoided?	Yes	Complete workplace inspections and record actions to be carried out. Ensure combustible materials are removed and stored correctly.
15.5 Does furniture in the premises comply with the Furniture and Furnishings (Fire Safety) Regulations in relation to being fire retardant?	Yes	Most of the furniture in use around the site is in good condition. Dispose of furniture in poor condition.

15.6 Comment:		
16. Hazards introduced by outside contractors and building works		
Question	Response	Details/comments/numbers
16.1 Are fire safety conditions imposed on outside contractors?	Yes	All contractors are managed through the Management of Contractors Procedure HSP 805, inducted and monitored. Contractor has air horns and will obey air horns operated in the event of fire and muster at their assembly point near entrance to compound.
16.2 Is there satisfactory control over works carried out on the premises by outside contractors (including "hot work" permits)?	Yes	All contractors inducted and monitored. RAMS are scrutinized. Work that can be removed from site is taken away and repaired remotely. Permits to work required if working in hazardous areas and approval required. Management of Contractors Procedure HSP 805 followed and only Authorised Persons (Contractors) (AP(C)) may employ contractors.
16.3 If there are in-house maintenance personnel, are suitable precautions taken during "hot work", including use of "hot work" permits?	Yes	Hot work on site contracted out, hot work permits issued if work carried out on site. See 12.6
16.4 Is building work being completed at the time of the assessment?	No	To begin soon on inlet.
16.5 Are the works and processes compliant with the Construction Design and Management Regulations 2015 in relation to this fire risk assessment only?	N/A	You should continuously monitor the impact of the building work on the general fire safety precautions, such as the increased risk from quantities of combustible materials and accumulated waste and maintaining adequate means of escape. You should only allow the minimum materials necessary for the work in hand within or adjacent to your building. Activities involving hot work such as welding, flame cutting, use of blow lamps or portable grinding equipment can pose a serious fire hazard and need to be strictly controlled when carried out in areas near flammable materials. This can be done by having a written permit to work for the people involved (whether they are your employees or those of the contractor).
16.6 Comment:		
17 Dangerous Substances		
Question	Response	Details/comments/numbers
17.1 Do the Dangerous Substances and Explosive Atmospheres Regulations 2002 apply to this premises?	Yes	Biogas produced on site in digesters and stored in gas holder. Biogas used in boilers for digestion process or flared. Combined Heat & Power engines (CHP) decommissioned. Diesel on site, notification of site needs to be looked at due to amounts available to be held. Propane gas cylinders. Diagrams of zoned areas on site are required to be displayed in a prominent position for the emergency services.
17.2 Has a DSEAR risk assessment been carried out and when?	Yes	A DSEAR risk assessment for the digester and associated equipment has been carried out by SPE Consultants Ltd under DSEAR where an explosive atmosphere may occur in the workplace (see DSEAR regulations 5, 7 and 11). Work with propane and diesel etc. will be subject to site specific risk assessments.

17.3 Are the general fire precautions adequate to address the hazards associated with dangerous substances used or stored within the premises?	Yes	ATEX rated equipment used in zoned areas and maintained by competent person. • Automatic fire alarm system with manual call points in boiler building. • Methane detector in boiler building. • Automatic fire detection in control, generator and centrifuge buildings, substation, pumping station No1 and domestic detector in recirculation P.S. **No work is to be carried out without permission of the Digester Safety Controller (DSC).** No work other than routine inspection and operations must be undertaken on digesters without prior consultation and formal permission via DCWW Permit to Work System with Digester Safety Controller. All work activities associated with sludge digesters and associated equipment will be risk assessed. Where possible, action will be taken to eliminate the hazard, otherwise, control measures will be implemented to reduce health and safety risks to as low as is reasonably practicable.
17.4 Do the Control of Major Accident Hazards Regulations (COMAH) 2015 apply to this site?	No	H&S team to be advised that site may be notifiable under Site Notification Procedure HSP 705 on form HSF 705. The H&S Department will advise on the type of sign to be deployed once form HSF 705 has been received and reviewed.
17.5 Has the risk to relevant persons been adequately eliminated or reduced?	Yes	All relevant staff receive instruction in the normal operation and maintenance of the digestion plant as per training matrix. DSC receives additional training by an external provider. Operators undertake competent operator training. Site specific induction required for all employees /visitors / contractors. DSEAR awareness eLearning, fire awareness eLearning.
17.6 Other details:	Operational Manager or their deputies are responsible for notifying the H&S Department of any sites where a total quantity of 25 tons or more of dangerous substances are stored or used. H&S team to be advised that site may be notifiable under Site Notification Procedure HSP 705 on form HSF 705. The H&S Department will advise on the type of sign to be deployed once form HSF 705 has been received and reviewed.	
17.7 Comment:		

1202	GAS OIL or DIESEL FUEL or HEATING OIL, LIGHT (flash-point not more than 60 °C)	3	F1	III	3	640K	5 L	E1	P001 IBC03 LP01 R001		MP19	T2	TP1
1202	DIESEL FUEL complying with standard EN 590:2004 or GAS OIL or HEATING OIL, LIGHT with a flash-point as specified in EN 590:2004	3	F1	III	3	640L	5 L	E1	P001 IBC03 LP01 R001		MP19	T2	TP1
1202	GAS OIL or DIESEL FUEL or HEATING OIL, LIGHT (flash-point more than 60 °C and not more than 100 °C)	3	F1	III	3	640M	5 L	E1	P001 IBC03 LP01 R001		MP19	T2	TP1

18 Gas Cylinders		
Question	Response	Details/comments/numbers
18.1 Are gas cylinders held on site?	Yes	Propane used for the pilot gas for the flare. LPG gas is extremely flammable. Any specialist gas cylinders will be brought in by contractors i.e. nitrogen for purging.
18.2 Are the cylinders stored in an appropriate area	Yes	Some stored outside by flare. Ensure that all gas cylinders, when used on site will be stored in line with guidance provided by British Compressed Gases Association

		guidance note GN2 - *Guidance for the Storage of Gas Cylinders in the Workplace*. Gas cylinders should be stored in a dedicated storage area.
18.3 Are fuel and oxygen segregated?	N/A	
18.4 Are empty cylinders returned regularly?	Yes	
18.5 Is acetylene on site?	Yes	
18.6 Is the acetylene authorised by senior manager on FRA 03?	N/A	
18.7 Comment:		
19 Sources of Oxygen/Air		
Question	Response	Details/comments/numbers
19.1 Is there a forced air/air conditioning ventilation system?	Yes	Boiler room, UV MCC,
19.2 Does the ventilation system shut down in the event of fire?	No	Not known. Fire detection system in boiler room/MCC. Investigate if a fire is detected in the boiler room, are the boilers inhibited and ventilation fans shall shut down, and an alarm be raised.
19.3 Are fire doors kept closed?	No	If required to be kept open then a fire door retainer should be fitted which will allow the door to self-close properly in the event of an alarm. Fire doors should be kept locked shut or self-closers fitted, and working, to ensure they close to provide protection in the event of smoke or fire. Fire doors should be inspected 6 monthly, record checks and document all faults found, actions taken and rectification dates, in the fire logbook. Raise Safety issues by Near miss or hazard intervention reporting on Assure.
19.4 Are fire doors maintained in good condition and complete with intumescent seals?	No	Fire doors should be inspected 6 monthly, record checks and document all faults found, actions taken and rectification dates, in the fire logbook. Record checks and document all faults found, actions taken and rectification dates, relating to fire safety, in the fire logbook.
19.5 Is compartmentation/ passive fire protection in place and of a good standard?	Yes	With the exceptions above. When construction/maintenance work is carried out, ensure passive fire protection has not been defeated by unsealed cable or pipework holes.
19.6 Are there chemicals (oxidising materials), that can provide a fire with additional oxygen and so, help it burn.	No	
19.7 Are Oxygen supplies from cylinder storage and piped systems e.g. oxygen used in welding processes on site?	No	
19.8 Comment: Article 17 of The Regulatory Reform (Fire Safety) Order 2005 requires that a maintenance regime is established to ensure equipment such as fire doors are kept in an efficient state and Article 18 requires that the responsible person appoints competent person(s) to assist in undertaking preventive and protective measures.		

BS 9999 states that routine inspection and maintenance of fire safety installations should be carried out; this includes ensuring fire resisting doors and escape doors are correctly installed and maintained, with inspections carried out every 6 months**.**

20 Fire hazards that warrant consideration including process hazards (*This to include any fire hazards from any process; heat producing, spark or friction generating, chemical or other process which has the capacity to ignite, create excessive or rapid heat or generate oxidising or flammable gas)*

Question	Response	Details/comments/numbers
20.1 Are process hazards apparent	Yes	Methane (CH_4), Carbon Monoxide (CO) in boiler house, Hydrogen Sulphide (H_2S) in centrifuge buildings. Methane detector monitors the cavity between the inner and outer membranes on the gas holder.
20.2 Are other hazards apparent	No	
20.3 Are High Voltages on site?	Yes	See 7.8

20.4 Comment: Chemicals used on site are as follows:

Chemical	**Grade**
Ferric Sulphate	PIX 113
Polyelectrolyte (Drum Thickener)	FLOPAM EM 640 LH
Polyelectrolyte (Centrifuge)	FLOPAM FO 4498 SSH
AWF Antifoam (Centrifuge)	5%

Buildings constructed with insulated sandwich cladding (assumed flammable insulation).
As far as possible, services penetrations through sandwich panels should be avoided. If this is not possible, any gaps should be adequately fire stopped. The external cladding should be checked at regular intervals to ensure that no damage or failure of joints is occurring that can expose the flammable core, any visible failure should be reported and repaired as a matter of urgency. Care should be taken to ensure that the core is not left exposed or damaged.

PART 3 PROVISION OF ELEMENTS OF FIRE SAFETY AS SECONDARY CONTROL MEASURES

21 Fire detection and warning

Question	Response	Details/comments/numbers
21.1 Is a reasonable manually operated fire warning system provided?	Yes	For areas of the site where there is no fire detection and alarm, or the fire detection system isn't audible, the method of shouting/calling/air horn is utilised.
21.2 Is the extent of automatic fire detection generally appropriate for the occupancy and fire risk?	Yes	The Centrifuge Control Building and associated buildings have smoke detectors linked to a Minerva 8 zone conventional fire panel. There are no fire alarm manual call points installed as part of the system and there is one external bell. The system would appear to be a category L5 and is remotely monitored. The boiler/MCC building has an automatic fire alarm system with MCPs.
21.3 Can the means for giving warning be clearly heard throughout the whole premises when initiated from any single point?	No	Fire alarm system cannot be heard throughout site, staff will be informed by remote Smart Hub. Some areas detection and raising alarm only on observation. For areas of the site where there is no fire detection and alarm, or the fire detection system isn't audible, a method of raising the alarm should be documented. Consider sending a person to give warning to personnel in other buildings/areas of the site shouting/ calling/ air horn are utilised.
21.4 If the fire detection and warning system is electrically powered, does it have a back-up power supply?	No	No maintenance carried out so assumed no battery backup.

21.5 Is there a remote transmission of alarm signals to control room?	Yes	Alarms are connected to the Smart Hub.
21.6 Are there instructions for your employees on how to operate the fire warning system and what action they should take on hearing a warning?	No	No training on the fire alarm system given to site staff. Confirm actions taken if fire is discovered and subsequent actions - Emergency Procedures state; Tackle the fire only if required as means of escape as per policy, use the correct fire equipment. Sound air horn and report to site supervisor. Senior Operator to check site personnel are accounted for - confirm actions taken if fire in area where no alarm system is in place
21.7 If automatic fire detection is provided, to what Standard (e.g. BS 5839 Part 1Grade L1/L2 etc.)?	P/L2	
21.8 If automatic detection, is it throughout the premises or partially?	No	Partially. The Centrifuge Control Building and associated buildings have smoke detectors. The boiler/MCC building has an automatic fire alarm system with MCPs.
21. 9 Is a zone plan sited adjacent to the control panel?	Yes	No zone plan for boiler room/MCC
21.10 Is the alarm system in good condition	No	Maintenance and testing not carried out. Disabled alarm panel in control building. Alarm system in boiler room not inspected or tested. Record all faults and rectifications in fire logbook.
21.11 Comment:		
22 Means Of Escape		
Question	Response	Details/comments/numbers
22.1 It is considered that the premises are provided with reasonable means of escape in case of fire. Identify the means of evacuation and attach a plan. (This can be a hand drawn plan).	No	The premises are provided with reasonable means of escape in case of fire but, the generator room escape route ends in a compound which cannot be left as all exits require a key. Some of these final exits require maintenance.
22.2 Is it considered that the premises are provided with reasonable arrangements for means of escape for disabled people?	N/A	There are currently no persons on site who require assistance
22.3 Are Personal Emergency Evacuation Plans (PEEPS) in use; provide details of these.	N/A	There are currently no persons on site who require assistance This will need to be risk assessed when required
22.4 Are there refuge points/safe areas within the building?	No	

22.5 Do refuge points/safe areas have means of communication?	N/A	Some exits on escape routes are damaged and hardware missing. Record inspection, faults found and maintenance in fire logbook.
22.6 Adequate design of escape routes?	No	The generator room escape route ends in a compound which cannot be left as all exits require a key.
22.7 Reasonable distances of travel	Yes	
22.8 Suitable protection of escape routes? (Fire resisting construction)	Yes	
22.9 Adequate provision of exits? State the capacity of each exit.	Yes	A clear width of at least 750mm can accommodate up to 100 people in normal risk premises.
22.10 Exits easily and immediately open-able where necessary without the use of a key?	No	The generator room escape route ends in a compound which cannot be left as all exits require a key.
22.11 Do Fire exits open in direction of escape where necessary?	Yes	
22.12 Escape routes unobstructed?	No	Remove unwanted material from escape routes so personnel can evacuate. Remove hazards i.e. slips trips and falls. Some routes obstructions -stores, etc. Escape routes have to be checked regularly, inform staff/visitors of restrictions to escape routes. Record inspection, faults found and maintenance in fire logbook.
22.13 Does the evacuation plan fit with the floor space factors?	Yes	
22.14 Identify dead end corridors. Are the appropriately covered?	N/A	
22.15 Identify inner rooms. Are they appropriately covered?	Yes	
22.16 Comment:		
23 Measures To Limit Fire Spread And Development		
Question	Response	Details/comments/numbers
23.1 Is compartmentation of a reasonable standard? (Fire resisting) Identify compartmentation.	Yes	Buildings mainly constructed of fire resisting materials e.g. brick, block, concrete, steel**.**
23.2 Are there reasonable limitation of linings that may promote fire spread? (Walls and ceilings)	Yes	Buildings constructed of fire resisting materials e.g. block, brick, concrete and steel frame.
23.3 As far as can be reasonable ascertained, fire dampers are provided in ducts or vents as necessary to protect critical means of escape routes against passage of	N/A	

fire, smoke and combustion products in the early stages of a fire?		
23.4 Comment:		
24 Emergency Escape Lighting		
Question	Response	Details/comments/numbers
24.1 Is it considered that there is a reasonable standard of emergency escape lighting to identify and ensure safe use of escape routes?	Yes	
24.2 Comment:		
25 Manual Fire Extinguishing Appliances		
Question	Response	Details/comments/numbers
25.1 Reasonable provision of portable fire extinguishers?	No	Many extinguishers missing, believed to be in Chester WWTW, others observed were out of date, last inspected by competent person 2019.
25.2 Are the right types of extinguishers located close to the fire hazards?	No	See above. Attention is drawn to BS 5306-8 Clause 5.4.3 states that powder extinguishers should not be used indoors unless specified by a health & safety risk assessment.
25.3 Are all fire extinguishing appliances readily accessible, unobstructed? (i.e. mounted on walls or on bases) and signage provided relevant to extinguisher?	No	Many extinguishers missing, believed to be in Chester WWTW. Some extinguishers are obstructed. A good practice is numbering and recording the site and type of extinguisher so they can be located and replaced in their correct position.
25.4 Have the people likely to use the fire extinguishers been given adequate instruction and training?	Yes	Health and Safety team state training requirement is completion of fire awareness eLearning - see 12.6
25.5 Are tests carried out on hydrants on site?	N/A	Hydrants and hoses provided for wash water on sites are not part of the fire safety arrangements.
25.6 Comment: Carry out monthly visual inspections of all portable fire extinguishers as per Fire Safety procedure HSP 113. Record inspection, faults found and maintenance in fire logbook.		
26 Automatic Fire Extinguishing Systems		
Question	Response	Details/comments/numbers
26.1 Type of fixed system and location: (gas suppression systems, sprinklers/misting systems etc.)	No	
26.2 Comment:		
27 Fixed Fire Systems And Equipment		
Question	Response	Details/comments/numbers
27.1 Type of fixed system and location: (i.e. Dry/wet risers, fireman's lift	No	

control, smoke ventilation, smoke curtains etc.).		
27.2 Comment:		
28 Fire Safety Signs And Notices		
Question	Response	Details/comments/numbers
28.1 Is there a reasonable standard of fire safety signs and notices?	No	Some signage missing or faded. Carry out signage audit. Ensure signage to guide personnel from buildings is correct, Fire Action Notices, Fire door keep closed or locked, fire exit keep clear, door operating instructions e.g. push bar to open.
28.2 Comment:		
29 Firefighter Switch		
Question	Response	Details/comments/numbers
29.1 To isolate high voltage luminous tube signs, etc. (to include location)?	No	
29.2 To isolate fuel pumps and electrical items.	No	
29.3 Comment:		
PART 4 Management of fire safety		
30 Procedures and Arrangements		
Question	Response	Details/comments/numbers
30.1 Fire safety is managed by:	**Jason McKeown**- Catchment Operational Supervisor – 07788361428	
30.2 Are competent person(s) appointed to assist in undertaking the preventative and protective measures (i.e. relevant general fire precautions)? State name and responsible element of fire safety	No	Determine number of persons required for Fire Marshal using FWC 01. Personnel who are appointed to assist in undertaking the preventative and protective measures (i.e. relevant general fire precautions such as completing the fire safety checks and recording in fire logbook, Workplace Inspections) must be trained and the appointment recorded on their PWP
30.3 Is there a suitable record of the fire safety arrangements?	No	**Article 11 – Fire safety arrangements** Under this article, the responsible person must make and implement arrangements for planning, organising, controlling, monitoring and review of the preventative and protective measures required by the Order (general fire precautions). This gives rise, in the first instance, to the requirement for an **emergency plan** including the measures for ensuring the effective operation of the plan and for ongoing checks of the appropriateness of the plan and other measures. These arrangements will typically also relate to measures required by means of other articles, such as those for the **appointment of competent persons to assist** (organisation and control), the need to review the assessment (monitoring) and so forth. The purpose is to require effective management control of the fire safety arrangements in the premises. Enforcing authorities should take particular note of the need for arrangements made by the responsible person to be 'appropriate, having regard to the size of [an] undertaking and the nature of its activities'. This will also include the hazards and risks that are present.

		The arrangements must be recorded where five or more persons are employed (whether in one location or spread over a number of locations), a licence is in force, or an alterations notice requiring such a record is in force in relation to the premises. See actions.
30.4 Are procedures in the event of a fire appropriate and properly documented? i.e. investigating alarm signals.	No	Include on induction e.g. the person discovering an emergency / fire should raise the alarm by calling out/ shouting to warn fellow colleagues on site or using manual call points. What to do if no alarms system is available etc. Fire emergency plan template is available in fire logbook here. Produce plan so that fire safety arrangements are clear and up to date and implemented, keep in the logbook and display in a prominent place, template can be found in the online fire logbook. Produce evacuation plan for normally occupied buildings to show escape routes etc.
30.5 Are there suitable arrangements for summoning the Fire and Rescue Service (F&RS)?	Yes	Ring 999 from land line or 999 from mobile. Include on induction the how the emergency services are summoned.
30.6 Are there suitable arrangements to meet the F&RS on arrival and provide relevant information, including that relating to hazards to fire fighters?	No	Fire Emergency Plan states; Procedures for liaison with Fire Brigade on arrival - Area Senior Operator, no recorded procedure if Senior Ops is not on site.
30.7 Is there a plan of the building available indicating basic layout and any areas of significant risk?	No	Produce site plan showing hazardous areas including HV locations, diesel tank, flammable material storage etc. Consider grab/battle bag with site plans etc. to present to the F&RS if they need to attend site.
30.8 Are there suitable arrangements for ensuring that the premises have been evacuated?	No	Visitors sign visitor's logbook at entry to mess building. Fire Emergency Plan states: Area Senior Operator to check site personnel are accounted for, no recorded procedure if Senior Ops not on site. Ensure personnel attending site sign in the site staff and visitors logbook to ensure all are accounted for in the event of emergency. Ensure all persons sign out when they leave.
30.9 Is there a suitable fire assembly point(s)?	Yes	Consider re-siting the assembly point. The assembly point is beneath the office building. The assembly points should be located sufficiently far from the premises to minimize interference with the fire and rescue service or danger from falling debris but should be accessible and not so far away as to discourage people from assembling. When all accounted for then an assessment should be made as where personnel will be sited for safety and to guide the F&RS.
30.10 Are there adequate procedures for evacuation of any disabled people who are likely to be present?	N/A	Site staff will be unaware if any site visitor has special requirements. This will need to be risk assessed when required. **Fire Safety Procedure HSP 113**; For employees where there is doubt as to their ability to take part unaided in fire or other emergency evacuation from a building, the line manager, through discussion with the employee, shall produce

		a Personal Emergency Evacuation Plan (PEEP) on form FRA05 PEEP. Advice should be sought from the H&S function if needed. **Although a PEEP would not normally be produced for a temporary visitor, visitors who may have difficulty evacuating in an emergency must be considered in fire evacuation plans.**
30.11 Persons nominated and trained to assist with evacuation, Including evacuation of disabled people?	No	
30.12 Appropriate liaison (if necessary) with Fire and Rescue Service? Rescue Service crews visiting for familiarisation visits?	No	Arrange site visit by F&RS for familiarisation on hazards. Record visits in logbook and obtain fire officers signature confirming site visit.
30.13 Routine in-house inspections of fire precautions (e.g. in the course of health and safety inspections)?	No	Produce fire logbook and maintain up to date with all required testing, inspections, faults, rectification etc. as per Fire Safety procedure HSP 113, must be recorded and must be available on site so that records can be shown to the enforcing authority when demanded.
30.14 Comment:		
31 Training and drills		
Question	Response	Details/comments/numbers
31.1 Fire safety training is managed by:	T&D and locally by Supervisors	
31.2 Are all staff given adequate fire safety instruction and training on induction? More specifically below:	Yes	Induction which includes actions to be taken in the event of fire must be given to all employees and visitors based on site to ensure they know what to do in the event of a fire. eLearning carried out
31.3 Does it incorporate: Fire risks in the premises, general fire precautions in the building, action in the event of a fire, on hearing the fire alarm, operation of manual call points, location and use of fire extinguishers, means for summoning the fire and rescue service, identity of persons nominated to assist with evacuation?	No	See 30.4
31.4 Are all staff given adequate training and periodic 'refresher' training at suitable intervals? If yes, at what intervals?	Yes	All staff have fire induction initially then 3 yearly Induction, and fire awareness eLearning refresher training. Procedures briefing and risk assessment awareness are also refreshed.
31.5 Are all staff with special responsibilities (e.g. fire wardens, staff who assist with disabled people,	No	Site staff will be unaware if any site visitor has special requirements. This will need to be risk assessed when required.

personnel trained in extinguisher use) given additional training?		
31.6 Is there sufficient and adequate channels of communication of fire safety information between employer and employee (e.g. Health & Safety meetings, notice boards etc.)?	Yes	Health & Safety meetings, notice boards, fire awareness eLearning, procedures briefing, fire action notices, near miss reporting on Assure and risk assessment awareness.
31.7 Fire drills carried out at appropriate intervals and a record of such drills maintained?	No	Last one recorded was on 02/05/2017. Carry out fire drills as required, see Fire Safety H&S Procedure HSP 113 or fire logbook for more information. Record results in a fire logbook and document actions to be taken.
31.8 Comment:		
32 Shared Site Protocols (HSP 115)		
Question	Response	Details/comments/numbers
32.1 When the employees of another employer work in the premises, are they provided with adequate instructions and given appropriate information (e.g. on fire risks and fire safety measures)?	Yes	For info - You should liaise and exchange information with contractors who will also have a duty under the Construction (Health, Safety and Welfare) Regulations 199611, 12 to carry out a risk assessment and inform you of their significant findings and the preventive measures they may employ. This may be supported by the contractors' agreed work method statement. The designer should also have considered fire safety as part of the Construction (Design and Management) Regulations 1994 (the CDM Regulations).
32.2 Is there adequate co-operation and co-ordination between different Responsible Persons (Multi-Occupancy) to ensure compliance with the Fire Safety Order?	Yes	
32.3 Comment:		
33 Testing, maintenance and records		
Question	Response	Details/comments/numbers
33.1 Is there adequate maintenance of the workplace?	No	See assessment. Site inspections should identify defects and shortcomings on site.
33.2 Is a Fire Logbook on site?	No	Produce fire logbook and maintain up to date with all required testing, inspections, faults, rectification etc. as per Fire Safety procedure HSP 113, must be recorded and must be available on site so that records can be shown to the enforcing authority when demanded.
33.3 Is weekly and periodic testing and servicing of fire detection and alarm system, including ancillary equipment taking place?	No	Carry out weekly and periodic testing and servicing of fire detection and alarm system, Record routine servicing and maintenance in fire logbook. Carry out testing/inspecting as required in HSP 113 and record in fire logbook.
33.4 Monthly and annual testing routines for	No	Many Emergency lights did not have indication LED lit suggesting the emergency light is not working or charging. Carry out monthly

emergency escape lighting?		checks and repair/replace faulty lights and record faults and tests. Site electrician monthly recorded on SAP.
33.5 Periodic checks and annual maintenance of fire extinguishing appliances?	No	Monthly checks require to be carried out and recorded. Annual servicing and maintenance to be carried out by Chubb.
33.6 Periodic inspection of external escape staircases and gangways?	Yes	WP07 Sectional flooring and suspended floors Inspection WP08 Handrail Inspection carried out.
33.7 Six monthly inspection and annual testing of rising mains?	N/A	
33.8 Weekly and monthly testing, six monthly inspection and annual testing of fire-fighting lifts?	N/A	
33.9 Weekly testing and periodic inspection of sprinkler installations?	N/A	
33.10 Routine checks of final exit doors and/or security fastenings?	No	This is to be recorded in fire logbook and rectification recorded when complete.
33.11 Annual inspection and testing of lightning protection system?	N/A	
33.12 Other relevant inspections or tests:	No	
33.13 Are all the above, and faults found, being recorded in the fire logbook?	No	Refer to Fire Safety HSP 113 for required testing/checks/ inspections relating to fire safety. Record all faults found, actions taken and rectification dates in the fire logbook. Raise Safety issues by Near miss or hazard intervention reporting on Assure.
33.14 Are records held and available for inspection by Fire Authority if required.	No	Produce fire logbook and ensure all checks/testing/inspections carried out by site staff or competent persons e.g. Chubb, that are required in Fire Safety Procedure HSP 113 are being carried out and results recorded in the fire logbook e.g. all faults found, actions taken and rectification dates. The Fire logbook must be available for scrutiny by FRS.
33.15 Are suitable systems in place for reporting and subsequent restoration of safety measures that have fallen below standard?	Yes	Near miss or hazard intervention reporting on Assure, TAF books, reporting to supervisors.
33.16 Comment:		

PART 5 ACTIONS	Site: Queensferry WWTW and AD 00932
	Date: 11th January 2023

Risk Rating	Priority	Action timescale
Very High Risk	1	Immediate action required
High Risk	2	Within 28-days
Medium Risk	3	Within 3 months
Low Risk	4	Within 3 - 6 months
Ongoing	5	Long term maintenance schedule

Action plan

Item No	Action	Priority	By whom	Comments/Mitigation	Date closed
5.2	Previous FRA 02s Oct 2019 and Apr 2019 no name for assessor. FRA 01 Completed on 03/11/2016, 14:03 no name of company who carried out assessment - Delyn Safety? Many of the actions in previous FRA 01 03/11/2016 have not been completed. The completed or mitigated required actions could not be found on the previous FRA. Completed action sheet with persons responsible, dates closed down and mitigation, if not carried out. Update FRA and keep with fire logbook somewhere accessible so it can be shown to the enforcing authority when demanded.	2			
5.3	The FRA 01 requires to be reviewed on an FRA 04 annually as per Fire Safety procedure. Record FRA 04 on Source. Previous FRA 04 found carried out June 19.	5			

7.3	There were items of equipment out of date or not Portable Appliance Tested throughout site. Remove if not required or carry out Portable Appliance Test (PAT). Include on induction the need for electrical safety procedures to be followed on site. Electrical equipment to be PAT and unused equipment turned off.	2			
7.5	If used ensure leads are unrolled to prevent extension leads overheating and do not overload. Consult electrical specialist over UV building extension lead electrical loading, two air conditioners and fan are being run off a single extension lead. If required on a permanent basis sufficient fixed electrical sockets should be wired into the electrical circuit.	2			
7.6	Brief staff that equipment to be turned off when not required and that some personal electrical appliances may not be charged on DCWW sites e.g. e-cigarettes. Include on induction.	2			
7.10	Remove unwanted/damaged electrical equipment from site.	3			
8.4	Informed that site was a no smoking area but smoking takes place. Enforce no smoking or provide ashtray or container for cigarettes. Consider having the dedicated smoking area away from the building entrance/exit as personnel using this entrance /exit will have to pass through smoke or the entrance may be used as a shelter.	3			
8.5	Cigarette ends found around outside table on the ground. Enforce no smoking or provide dedicated smoking area and ashtray or container for cigarettes.	2			

9.1	A number of break-ins and intruders have occurred and items have been stolen but no indication of attempted arson. Commission intruder alarm so that indication of break ins are alerted.	2			
10.6 & 17.6	H&S team to be advised that site may be notifiable under Site Notification Procedure HSP 705 on form HSF 705. The H&S Department will advise on the type of sign to be deployed once form HSF 705 has been received and reviewed.	2			
10.6	Stand by generator diesel storage tank has not got an isolating valve e.g. trigger nozzle, on the diesel delivery flexible pipe. Ideally you should use a trigger nozzle with an automatic shut off system similar to those used at petrol filling-stations. If you have a trigger nozzle without an automatic shutoff, it must not be capable of being fixed in the open position. Nozzles with lever shut-off valves must not be used, they do not comply with the Water Resources (Control of Pollution) (Oil Storage) (Wales) Regulations 2016. See comments section 10.6	2			
10.6	Old oil cans/drums in old digester control and in other rooms within the site require removal or bunding.	2			
10.7	Consider fitting a CO detector in the boiler room. If fitted, test CO monitor on a regular basis and employees must be instructed in; knowing alarms, the meaning of the alarm, what to do on hearing the alarm and to recognize the symptoms of CO poisoning.	2			

11.2	Fire extinguisher in mess building missing and fire blanket requires wall mounting in a suitable position.	1			
12.1 & 12.4	Welding bay on site but not used. Remove not required old equipment from site to prevent any unauthorised personnel carrying out welding	3			
13.2	Testing of Lightning Protection System (LPS) requires to be carried out in accordance with DCWW procedures. No evidence to suggest this. Complete records should be kept of all maintenance procedures and should include corrective actions taken or required.	2			
15.1 – 15.5	Housekeeping standards in workshop with welding equipment areas need improving to segregate combustible from potential ignition sources. Complete workplace inspections and record actions to be carried out. Ensure combustible materials are removed and stored correctly.	3			
17.2	Diagrams of zoned areas on site are required to be displayed in a prominent position.	2			
19.2	Investigate that if in the event of fire alarm does the ventilation shut down and the gas for the boilers isolated.	2			

19.3 & 19.4	Fire doors should be kept shut with self-closers fitted and working or locked shut to ensure they close to provide protection in the event of smoke or fire. Remove wedges and ensure fire doors are kept closed. Carry out maintenance on doors that do not close correctly. Fire doors should be inspected 6 monthly, record checks and document all faults found, actions taken and rectification dates, relating to fire safety, in the fire logbook.	1			
21.3	Fire alarm system cannot be heard throughout site, staff will be informed by remote Smart Hub. Some areas detection and raising alarm only on observation. For areas of the site where there is no fire detection and alarm, or the fire detection system isn't audible, a method of raising the alarm should be documented. Consider sending a person to give warning to personnel in other buildings/areas of the site shouting/ calling/ air horn are utilised.	2			
21	The fire alarm systems installed require testing, inspection and maintenance. Training must be given on the operation to site staff. Consider linking to SCADA so early warning is given to site staff. Record checks and faults in fire logbook and near miss or hazard intervention reporting on Assure.	2			

21.6	Update Fire emergency Plan and Emergency Procedures which state the actions in the event of smoke or fire is 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: The first action should be “raise the alarm”.	2			
22	The stand-by generator room escape exit route ends in a secure compound which cannot be left as all exits require a key. The final exit door closes and locks when passed through so anyone without a key cannot leave and is locked in the compound. Push bar for the compound gate should be fitted so escape to a place of ultimate safety can be made. Some of these final exits require maintenance. Record inspection, faults found and maintenance in fire logbook.	1			
22.12	Remove unwanted material from escape routes so personnel can evacuate. Remove hazards i.e. slips trips and falls. Some routes obstructions -stores, etc. Escape routes have to be checked regularly, inform staff/visitors of restrictions to escape routes. Record inspection, faults found and maintenance in fire logbook.	1			

25	Many extinguishers missing, believed to be in Chester WWTW, others observed were out of date, last inspected by competent person 2019. Return all extinguishers to site and have out of date extinguishers inspected by the Competent person. A good practice is numbering and recording the site and type of extinguisher so they can be replaced in their correct position	1			
25	Attention is drawn to BS 5306-8 Clause 5.4.3 states that powder extinguishers should not be used indoors unless specified by a health & safety risk assessment. Produce H&S risk assessment.	2			
25	Carry out monthly visual inspections of all portable fire extinguishers as per Fire Safety procedure HSP 113. Record inspection, faults found and maintenance in fire logbook.	2			
28.1	Some signage missing or faded. Carry out signage audit. Ensure signage to guide personnel from buildings is visible, Fire Action Notices, Fire door keep closed or locked, fire exit keep clear, door operating instructions e.g. push bar to open.	3			
30.2	Appoint competent persons to assist in maintaining the fire safety arrangements. Personnel who are appointed to assist in undertaking the preventative and protective measures (i.e. relevant general fire precautions and Fire safety arrangements such as completing the fire safety checks and recording in fire logbook, Workplace Inspections) must be trained and the appointment recorded on their PWP. See comments in 30.3	1			

30.4	Include on induction e.g. the person discovering an emergency / fire should raise the alarm by calling out/ shouting to warn fellow colleagues on site or using manual call points. What to do if no alarms system is available etc. Fire emergency plan template is available in fire logbook here. Produce fire emergency plan so that fire safety arrangements are clear and up to date and implemented, who does what and when (take into account if a stated person is not on site etc.) and keep in the logbook and display in a prominent place, template can be found in the online fire logbook. Produce evacuation plan for normally occupied buildings to show escape routes etc.. See comments 30.4 and 31.3. Brief staff when complete.	2			
30.7	Produce site plan showing hazardous areas including HV locations, Zoned areas, propane bottle store, diesel tank, flammable material storage etc. to enable F&RS to identify dangerous areas. Consider grab/battle bag with site plans etc. to present to the F&RS if they need to attend site.	2			

30.9	Visitors sign visitor's logbook at entry to mess building. Fire Emergency Plan states: Area Senior Operator to check site personnel are accounted for, no recorded procedure if Senior Ops not on site. Ensure personnel attending site sign in the site staff and visitors logbook to ensure all are accounted for in the event of emergency. Ensure all persons sign out when they leave.	1			
	Consider re-siting the assembly point. The assembly point is beneath the office building. The assembly points should be located sufficiently far from the premises to minimize interference with the fire and rescue service or danger from falling debris but should be accessible and not so far away as to discourage people from assembling. When all accounted for then an assessment should be made as where personnel will be sited for safety and to guide the F&RS.	3			
30.11	Arrange site visit by F&RS for familiarisation on hazards. Record visits in logbook and obtain fire officers signature confirming site visit.	3			
31	Incorporate on induction; Fire risks in the premises, general fire precautions in the building, action in the event of a fire, on hearing the fire alarm, operation of manual call points, location and use of fire extinguishers, means for summoning the fire and rescue service, identity of persons nominated to assist with evacuation.	2			

31.7	Carry out fire drills as required, see Fire Safety H&S Procedure HSP 113 or fire logbook for more information. Record results in a fire logbook and document actions to be taken.	1			
33.2	Produce fire logbook and maintain up to date with all required testing, inspections, faults, rectification etc. as per Fire Safety procedure HSP 113, must be recorded and must be available on site so that records can be shown to the enforcing authority when demanded.	2			
33.3	Carry out weekly and periodic testing and servicing of fire detection and alarm system, Record routine servicing and maintenance in fire logbook. Carry out testing/inspecting as required in HSP 113 and record in fire logbook.	1			
33.4	Many Emergency lights did not have indication LED lit suggesting the emergency light is not working or charging. Carry out monthly checks and repair/replace faulty lights and record faults and tests.	1			
33.5	Carry out monthly visual inspections of all portable fire extinguishers as per Fire Safety procedure HSP 113. Record inspection, faults found and maintenance in fire logbook. Annual servicing and maintenance to be carried out by Chubb record in fire logbook	2			
33.10	Carry out inspections of all final exits as per Fire Safety procedure HSP 113. Record inspection, faults found and maintenance in fire logbook.	2			

33	Produce fire logbook and ensure all checks/testing/inspections carried out by site staff or competent persons e.g. Chubb, that are required in Fire Safety Procedure HSP 113 are being carried out and results recorded in the fire logbook e.g. all faults found, actions taken and rectification dates. The Fire logbook must be available for scrutiny by FRS.	2			