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Goddards Green Sludge Treatment Centre Accident Management Plan

November 2024

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Goddards Green Sludge Treatment Centre Accident Management Plan

November 2024

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1 Introduction

This Accident Management Plan (AMP) describes the requirements, procedures and actions to be taken in the event of an environmental accident or incident at Goddards Green Sludge Treatment Centre (STC), also referred to as the “Site”. This plan will support the Goddards Green STC Environmental Management System.

1.1 Scope

Environmental accidents and incidents shall cover emissions to air, land or water that can cause harm to the environment.

This plan is written in accordance with the IED Environmental Permit application requirements for Goddards Green; BAT, specifically BAT1; and associated written management systems and procedures. Southern Water is required to review this plan annually, unless there are incidents, operational or managerial changes at the Site, which would require an earlier review.

The Site is staffed 14 hours a day, and the remaining 10 hours are covered by staff on standby.

The Site also operates under an Incident Management Plan (IMP), to be read in conjunction with this Accident Management Plan, which is incorporated into Southern Water’s Environmental Management System to prevent and manage environmental related accidents. The IMP 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 (Site manager, Environmental Governance Manager and key HSE staff), national and regional (where appropriate) contact details of emergency services and environmental regulators. The IMP is distributed to key staff, to supervise the implementation of the Plan, and shared with external contacts (emergency services and the Environment Agency). The IMP is 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 IMP references procedures to comply with environmental legislation and protect the environment and human health in regard to potential accidents:

- Spill prevention and management, and operation of safety valves
- Procedures for recovering spilled product
- Procedures for the prevention of overflowing vessels, and the 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

There are several different document types referenced in the IMP. These have been listed below:

- EMS – Environmental Management System
- FEC – Field Event Co-ordinator's Manual
- IMP – Incident Management Plan

- BCP – Business Continuity Plan
- CCM – Control Centre Manual
- SIB – Safety Instruction Book
- CAT – Catastrophe Plans

Southern Water is committed to continual environmental improvements, including minimising the risk of accidents both on the Site and its operations and in the wider environmental setting. This commitment is delivered through efficient control of processes, capital investments, and environmental training.

1.2 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
Southern Water	Duty Manager, Control Centre 01903 272095	Duty Manager, Control Centre 01903 272095
Environment Agency	0800 807060 (Emergency Hotline) 0370 8506506 (Routine enquiries)	0800 807060 (Emergency Hotline) 03708 506506 (Routine enquiries)
Emergency Services	999	999
Local Police	999	999
Local Hospital	Princess Royal Hospital Lewes Road Haywards Heath Sussex RH16 4EX	999
EA Incident Hotline	0800 80 70 60	0800 80 70 60
EA Local Contact	0800 80 70 60	0800 80 70 60
Local Authority Emergency Planning Department	Emergency Planning Duty Officer Mid Sussex District Council (24 hr) 01444-458166	01444-458166
Borough Council	Mid Sussex District Council 01444-458166 (24 hr)	01444-458166 (24 hr)
Water Company	Duty Manager, Control Centre 01903 272095	Duty Manager, Control Centre 01903 272095
Gas Company	0800 111 999	0800 111 999
Electricity Company	UK Power Networks 08433 102243	UK Power Networks 08433 102243
Framework Waste Contractor	MTS 01634 250326	MTS 01634 250326
Specialist Spill Clean Up Contractor	MTS 01634 250326 Cappagh Browne 0330 3031279	MTS 01634 250326 Cappagh Browne 0330 3031279

2 Site information

2.1 Site location

Goddards Green Wastewater Works (WTW) and Sludge Treatment Centre (STC) is situated approximately 1.75 km northwest of Burgess Hill town, West Sussex, just off Cuckfield Road. The WTW site was built in 1992, with the addition of the STC in 2002.

Site address: Cuckfield Road, Goddards Green, West Sussex, RH17 5AL

National grid reference: TQ 28947 20659

2.2 Summary of Site and sensitive receptors

There are a number of sensitive receptors within 500m of the potential emission sources at Goddards Green WTW and STC. There are in total 5 buildings within a 325m – 400m radius of the site, and additionally one building 500m from the treatment works.

3 Accident Management Techniques

The IED Regulations require the identification of potential accidents associated with the operation of an Installation and implementation of measures to avoid or minimise the effects of an accident, should they occur. This section sets out the measures to be adopted at the Installation to minimise potential risks to the environment. See Section 6 for Emergency Response Procedures.

The Site has an IMP designed to give first response instruction and procedures to control any Incidents/Emergencies at the Site.

Table 3.1 below provides a list, along with a brief description of each, of the procedures which form part of the IMP.

Table 3.1: Supporting Emergency Procedures – IMP

Procedure Reference	Brief Summary
EMS 234 Chemical and Oil Storage	Specifies the standard for storage of chemicals and oils. Outlines the amounts of substances that can be stored on site without consent from the Local Authority, and details how these substances should be safely stored. Also includes Information on the auditing, training requirements and any associated documents.
EMS 260 Pollution Prevention (standard)	Specifies the standard for managing and reducing the risk of land contamination. Outlines the tasks a manager should complete i.e., ensuring spill kits are available, and who to contact in the event of an incident. The document also lists the measures that Southern Water should take to prevent pollution incidents. Also includes Information on the auditing, training requirements and any associated documents.
EMS 265 Discharges (Standard)	Sets the minimum standard of operation in managing effluent and potable water process discharges. Details definitions which relate to the procedure and outlines the standard. Also includes Information on the auditing, training requirements and any associated documents.
EMS 360 Pollution Prevention Procedure	Outlines the responsibilities of staff in relation to the procedure. The Procedure includes details on items such as site drainage, working on or near watercourses and excavations. As well as addressing different spill types; chemical, oil and sludge/sewage. Information on the auditing, training requirements, reporting forms and any associated documents.
EMS 361 Chemical Risk Assessment (Procedure)	Defines the procedure for assessing the environmental risk from bulk chemicals. Outlines the procedure for undertaking a risk assessment, and where required which EMS procedures need to be followed. Also addresses risk mitigation and employee awareness as well as the auditing, training requirements, reporting forms and any associated documents.
EMS 362 Environmental Fire Risk Assessment Procedure	Specifies the procedure for minimising the environmental consequence of a fire. Outlines the responsibilities of staff in relation to the procedure and provides a procedure for an Environmental Fire Risk Assessment. Information on the auditing, training requirements, reporting forms and any associated documents
EMS 363 Procedure for Managing oil spills on sites	Outlines the responsibilities of staff in relation to the procedure. The procedure details how to determine the severity of the spill for different scenarios; land, inland waters and coastal waters/beaches, and how to prevent, control and remediate the environmental damage caused by spillages from the site. Information on the auditing, training requirements, reporting forms and any associated documents.
EMS 364 Lime Spill Management Procedure	Outlines the procedure for managing lime chemical spills at STCs. Defines the responsibilities of staff, and the procedure for managing the spill including the spill assessment and notification and escalation. Information on the auditing, training requirements, reporting forms and any associated documents.

Procedure Reference	Brief Summary
EMS 365 Discharges Procedure	Defines the procedure that must be adopted when managing intermittent discharges. Outlines the responsibilities of staff in relation to the procedure and outlines the procedure where an emergency discharge is foreseeable for both emergency and stormwater and potable water. Information on the auditing, training requirements, reporting forms and any associated documents.
EMS 381 Operational Waste Procedures	Specifies the procedure for managing wastes. The procedure addresses the definitions of different waste types and outlines a general procedure for managing waste. Identifies where further procedures should also be followed for specific waste types e.g., asbestos, WEEE and waste oils. Information on the auditing, training requirements, reporting forms and any associated documents.
EMS 382 Hazardous Waste Procedures	Specifies the procedure for moving hazardous waste between different sites. The procedure addresses identifying hazardous waste, storage of hazardous waste, consignment notes and record keeping. Information on the auditing, training requirements, reporting forms and any associated documents.
EMS 461 Chemical Risk Assessment (Form)	A template for a chemical risk assessment including the following: <ul style="list-style-type: none"> ● Site details ● Chemical details ● Chemical classification ● Risk activity ● Risks for health, fire/DSEAR¹ and environment ● Handling, usage and storage requirements ● Management of spills ● Disposal and the safety data sheet.
EMS 480 Waste Descriptions	Provides written descriptions of different waste types covering the following: <ul style="list-style-type: none"> ● Process giving rise to the waste ● Waste characteristics ● Handling advice ● Containment ● Disposal ● Name of waste ● Waste classification ● Producer and registered office details ● EWC ● Controlled Waste Regulations 2012 description ● Waste type ● Form ● Temperature ● SIC code <p>Information on the auditing, training requirements, reporting forms and any associated documents.</p>
FEC 307 Reporting of Unauthorised Access, Including Loss, Theft and Vandalism	Outlines the responsibilities of staff in relations to the reporting these incidents, and the procedure to be followed. Also includes Information on the auditing, training requirements and any associated documents.
FEC 320 Process Related Incidents	Specifies the procedures to follow in responding to process-related pollution incidents. Responsibilities of staff are outlined in the procedure, as well as contacting the FEC, FEC actions and reporting procedures. Information on the auditing, training requirements, reporting forms and any associated documents

¹ Dangerous Substances and Explosive Atmosphere Regulations

Procedure Reference	Brief Summary
FEC 322 – Spillage Procedure	<p>Outlines the responsibilities of staff in relation to the procedure. The procedure outlines the process for handling spillages on site including:</p> <ul style="list-style-type: none"> • Spillage assessment • Notifications and escalation • Containment • Awareness and training <p>Information on the auditing, training requirements, reporting forms and any associated documents.</p>
IMPO_101 – Overview of the Incident Management Plan	This document sets out the overall structure of the Incident Management Plans and provides a short overview of each of the main plans
IMP 217 and IMP 218 Team Roles – Objectives and Responsibilities	Sets out the Objectives and Responsibilities for roles within the Incident Management Team and provides guidance for the ELT Representative. IMP 217 identifies when Southern Water should contact the Environment Agency, and IMP 218 identifies the process for contacting other authorities.
BCP 415 Guidance on Reporting Potential Media Interest	Sets out the types of incidents to be reported back by Field Operations Staff & Contract staff working on behalf of Southern Water that will potentially attract media interest, including contact numbers.
CCM 302 Procedure Following the Receipt of a Fire Alarm	Provides a consistent regional approach to dealing with any formal notification of a fire alarm within the Company. Outlines the responsibilities of staff, the procedure for when a fire alarm notification is received, inspections/audits, training and any associated documents.
SIB 603 Risk Assessment and Safety Instructions for Fire Awareness	<p>Covers the following:</p> <ul style="list-style-type: none"> • Training needs of staff and fire wardens • What Managers must provide (i.e. fire safety meetings, plans) • Inspections • Safety instructions for occupied sites, unoccupied sites, and company vehicles • Firefighting procedure • Records to be completed
CAT 303 Actions Following Severe Weather or Flood Warnings	<p>Outlines the plan of actions that should be undertaken following severe weather or flood warnings and the responsibilities of the staff under these circumstances. The procedure details checklists for the following scenarios:</p> <ul style="list-style-type: none"> • Impending severe weather, • Flood watch, • Flood warning, • Severe flood warning, and • An all-clear checklist. <p>Also includes Information on the auditing, training requirements and any associated documents.</p>
Environmental Emergencies Poster (EMS)	A poster which should be displayed on all sites. The poster lists the type of emergency (fires, spills etc) and both the action which should be undertaken the contact phone number which should be called. The poster also highlights a list of things which should be checked prior to work starting such as the H&S notice boards, environmental notice boards and continuity plans.
Pollution 30 Minute Plan	Outlines a five-step plan for responding to a pollution incident in 30 minutes and outlines what should be done at each of the five stages.
Site Chemical Risk Register	Southern Water electronic database containing an inventory of hazardous substances used and stored by Southern Water and those relevant to individual sites, helping Southern Water to control substance use and comply with the COSHH regulations
Alternative Response Coordinators Booklet	These documents provide flowcharts and a step-by-step guide for completing the Alternative Response tasks. Section 5: Resilience Guidance identifies criteria on when to contact local authorities and other first responders

A site-specific Fire Prevention Plan is available for Goddards Green to reduce the risk of fire and explosion. Please see the site-specific Fire Prevention Plan for full details of corrective measures.

3.1 Loss of Containment

3.1.1 Gas Escape

Loss of containment of gaseous materials at the Site 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 Installation the following measures have been adopted:

- The gas holders are double-membrane inflatable bag type holders, constructed of a Type IV fabric², which is resistant to UV and microbial degradation. The stored gas is contained within the inner membrane. 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 minimise release of fugitive emissions
- Storage vessels and pipework are subject to regular inspection, by the site operators to ensure the structural integrity of the system remains uncompromised
- All staff with responsibility for the handling or transfer of gaseous materials receive training for their role
- All staff on site will receive training in site emergency procedures and the actions to take in the event of discovering a gas leak as part of their mandatory site induction training
- The gas system has safety pressure release valves, which are designed to prevent over-pressurisation of the system. Gas emissions from this point are monitored on telemetry with immediate call-out of staff to remedy
- A waste gas burner is incorporated to deal with excess biogas and is the first point of relief for excess gas or pressure as an emergency measure

The Site is designed to meet the Dangerous Substances and Explosive Atmosphere Regulations (DSEAR). Consideration of the requirements of DSEAR is included in the Designers Risk Assessment including information on the operation and maintenance of the Installation to ensure DSEAR requirements are met.

An IMP is in place for the Goddards Green site. The IMP includes actions to be followed in the event of a loss of containment of gaseous materials at the Installation.

Preventative measures incorporated into normal operations include a DSEAR operational risk assessment that will be periodically reviewed and updated against the latest DSEAR regulations and guidance to ensure best practice is adopted.

A Leak Detection and Repair (LDAR) plan is in place at the Goddards Green STC.

² Type IV fabric is a biogas storage system that is constructed using a polyester fabric that has a PVC coating on both sides which makes it resistant to corrosive gas and heat.

3.1.2 Liquid Escape

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

- The storage vessels for all boiler feed water treatment chemicals and fuel storage liquid materials located within the installation are double-skinned or banded to 110% capacity and have been manufactured to the required British Standard using appropriate grade materials
- Where applicable, on-site storage tanks are banded to 110% of their storage capacity in line with environmental good practice and bands are regularly inspected for liquid content and emptied if required
- Regular monitoring of storage vessels, pipework and fluid levels is undertaken to ensure no fugitive emissions are being released
- Storage vessels, bands and pipework are subject to regular inspection by the Site Manager or the nominated deputy to ensure the structural integrity of the system remains uncompromised
- 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
- Spill kits comprising suitable materials for the containment of liquid spills have been placed throughout the site for the use of all staff
- Site surfaces surrounding liquid storage areas and transfer pipes are constructed of impermeable material and run off is diverted to appropriate drainage structures to prevent escape of fluids to surface waters or ground waters
- 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 and the actions to take in the event of discovering a liquid spillage and the use of spill containment measures as part of their mandatory site induction training

3.1.3 Material Storage

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

The levels of raw materials are checked and recorded.

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
- Retain copies of Supplier's Advice Notes
- 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 management systems

3.1.4 Odour

Biogas is a naturally odorous material; however, the high alkaline conditions present within the STC digesters, scrub most of the hydrogen sulphide (H₂S) (an odorous constituent) from the biogas, resulting in relatively low concentrations. In addition, there will be no other odour emissions at the site from normal operations at the Installation.

Sewage, sewage sludges and returned liquors can all contribute to odour on a STC. A number of odour release points/areas have been identified in Goddards Green STC, and a combination of good baseline site management and odour control measures have been implemented to manage these sources. Two odour control units are installed on the Site.

Regular inspection of site storage facilities and pipework will be undertaken to ensure that the structural integrity of the system remains intact in line with the Goddards Green 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 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 accordance with Field Event Coordinator's Manual (FEC) in relation to Reporting of Unauthorised Access, Including Loss, Theft and Vandalism (FEC 307). In light of this the potential for vandalism is considered to be effectively minimised.

The following measures have also been adopted as security measures:

- For visitors and unauthorised personnel, an intercom system at the Site entrance is used before entry is allowed
- On arrival at site, visitors must sign the visitor's book and also announce their arrival to staff in the control room
- The Site is staffed 14 hours a day, and the remaining 10 hours are covered by staff on standby.
- Eight CCTV cameras are positioned in key locations around the Site
- The Site is fully enclosed by chain-link fencing approximately 6ft in height, and a 2.5-3m steel palisade at the 2m metal gate controlled via the control room or key fob.

- 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
- Out-of-hour intruder alarms are set for buildings
- CCTV cameras onsite as a deterrent to any unauthorised visitors

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.

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 3.2 below. 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, absorbent material will be used to clear the spillage. The used materials will be removed and stored in suitable containers prior to authorised disposal. The Installation will incorporate impermeable paving with self-contained drainage.

Table 3.2: Raw Material and Process Chemical Storage

Raw Material / Process Chemical	Maximum storage amount (tonnes or m ³)	Storage
Biogas	<2000 m ³ max	Gas bag Digesters Pipelines Flare Stack CHP Engine.
Diesel Oil	50m ³	Tank
Diesel Oil	10m ³	Tank
Diesel Oil	0.3m ³	tank
Sludge	98m ³	Tank
Sludge Cake	<1,000m ³	Bays
Polymer	8 x 1m ³ /750kg bags	Bags
Lime (Dust).	Variable this is an unusual activity	In bags
Lime	20m ³	In bulk tank
Gas Cylinders	Welding / burning Equip.	Gas Bottles stored in a locked building overnight.

Raw Material / Process Chemical	Maximum storage amount (tonnes or m ³)	Storage
Aerosol Leaks of Biogas	Not Known as would be formed by leaks	Gas bag Digesters Pipelines Flare Stack CHP Engine
JCB Loader / MTS Tankers & Chemical Delivery tankers.	<200 ltrs Diesel Fuel tank on machine	Vehicle stored in a locked building overnight.
Sludge Biogas	768m ³ Head space	Tank
Hydrogen Peroxide	Next to Aeration lanes	Containers
Antifoam	1m ³	Intermediate Bulk Container (IBC)
Sludge	3,960m ³	Tanks
Sludge	400m ³	Tank
Antifoam	1m ³	Intermediate Bulk Container (IBC)
Lime	20m ³	In bulk tank
AD Blue	2.5m ³	Container

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 Site include:

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

Fire detectors and fire alarms are fitted in all buildings. Fire extinguishers are located at strategic points throughout the STC. All fire extinguishers are clearly marked and tested to confirm their functionality. All personnel will be made aware of their location and 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 Site to be followed in the event of fire incidents at the Site.

To reduce the risk of fires from the Anaerobic Digestion process, it is managed by controlling KPI's on process control on a SCADA control system, DSEAR risk assessments are in place, with 12 monthly service agreements in place around the Biogas system. Six monthly inspections on the Boilers and CHP systems are also conducted.

Controls to reduce the risk of fires are good signage and EX zoned areas with fencing and locked gate policy around DSEAR areas. Lightning protection is also in place on Biogas storage bags. Operational and maintenance staff have received training in both Biogas awareness and DSEAR.

The Digestion process risks are managed by DSEAR risk assessments, Zonal areas & Biogas training for site operators and maintenance staff along with "gas safe" contractors carrying out programmed maintenance activities.

3.1.9 Arson risks

With flammable or combustible materials there is always a risk of arson on a site. This risk is controlled by secure perimeter fencing and an electric gate at the main entrance of the Goddards Green site, plus adherence to a locked gate policy.

3.1.10 Contingency for Sludge Treatment Issues

In the case of incidents with sludge treatment, the mitigation measures related to sludge treatment processes are listed in Table 3.3. A full list of mitigation measures covering different processes of the entire site can refer to the operational continuity plan of Goddards Green.

Table 3.3: Mitigation measures with sludge treatment incidents

Incident	Mitigation measures
Strain Press failure	<ul style="list-style-type: none"> Site closure to all cake imports. Sludge team to make arrangements for alternative disposal until the issue has been rectified.
Tank Leakage	<ul style="list-style-type: none"> Isolate tank and drain if required or patch the hole
CASS basin air pipe leakage/ shut down	<ul style="list-style-type: none"> Remove some flow from the tap by the influent feed pumps and divert to the works return overnight while the load on the works is low. Reduce digester feed.
Caustic Dosing Failure	<ul style="list-style-type: none"> Add caustic into the liquor pumping station. IBCs on site.
Centrifuge Failure	<ul style="list-style-type: none"> Reduce digester feed, lower the level in the secondary digester (keep below 8 metres to protect the gas line), repair or get a hire unit in.
Drum Thickener Failure	<ul style="list-style-type: none"> Feed the digesters with thin sludge, repair or compensate using the cake blending
Whessoe Release	<ul style="list-style-type: none"> Inform as a pollution. Try and get the flare stack or the CHP running asap. Reduce/stop feed to digester to stop foam overs. Get DSL to flush the gas lines. Speak to the EDINA service desk to understand any CHP issues.
Contaminated Trade	<ul style="list-style-type: none"> Liaise with network protection officer, increase the DO level to remove contaminants
Reduced Sludge Disposal	<ul style="list-style-type: none"> Remove from site if both digesters fail, very minor threat to site.
Odour Control	<ul style="list-style-type: none"> Run portable odour suppression equipment. ERG to maintain current
Storming	<ul style="list-style-type: none"> Storm tanks will fill as per the permit conditions. The tanks will need to be manually cleaned after any storm event. Maintained 24-hour response telemetry alarm system to notify SWS of overflow operating. During storm conditions the returns from the STC and cess reception enter the WtW process downstream of the storm separation point. As such all wastewater returns from the installation must go through the WtW treatment process and cannot be directly discharged during storm conditions.
Hydraulic overload	<ul style="list-style-type: none"> FFT flow control valve will restrict flows to maximum FFT whilst remaining flows pass directly to the storm tanks. Valve to be manually operated to achieve maximum FFT in the event of valve failure.
Site Flooding	<ul style="list-style-type: none"> FFT to automatically send all flows to storm in the event of the ASP feed pumping station failure. However, this will result in non-compliant discharge.

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 assessments used for standard rules “SR2012 No11 and No12”, “SR2009 No 4” and “SR2008 No 19”, 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

Severity index	Probability index		
	Low	Medium	High
Low	Low	Low	Medium
Medium	Low	Medium	High
High	Medium	High	High

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.	Tank failure, spillages of digestate and/or liquids including oil.	Aquatic or chronic effects to aquatic life, contamination, and water deterioration of water quality.	Direct run-off from the Site across ground surface, via surface water drains, ditches etc.	Medium	High	High	Potential for leaks from digestions tanks, storage vessels / bays and drainage system which may cause contamination or deterioration of surface water quality.	The Site drainage plan is documented and all staff are trained in the event of emergency or accident.	Medium
	Damage to drainage system.		Indirect run-off via the soil layer.				The hardstanding and pavement across the site are in reasonable condition.	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 surrounding the STC and WTW.	
	Spillage of raw materials of sludge/liquor during delivery/storage.		Transport through soil/groundwater then extraction / abstraction at borehole or intake.				Parts of the site are bunded including storage areas for raw materials and waste stored on-site. However, there are areas of gravel and grassland across the site. There is gravel to the rear of the digester bunds and some plant growth at the concrete joins, suggesting they may not be fully sealed or bunded.	There is a waste area to the south of the main building where all skips and bins are stored on a hardstanding area.	
Contaminated run off from cake storage e.g. containing suspended solids.							Where hardstanding is in place, all water flows to the drainage network which diverts all water to the head of works.	Barriers such as bollards are provided in front of storage vessels, including those within the THP activity, to prevent accident impact by vehicles.	
							There are also some grassed areas adjacent to hardstanding, including at a low point in the southern part of the Site.	Additional containment around digesters and other storage vessels is subject to a risk assessment and will be undertaken as part of the BAT requirements and in accordance with the Construction Industry Research and Information	

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
							<p>Holes in some of the tanks have been patched.</p> <p>A pond exists on the site which lies in an area of low ground to the east of the cake bays. Anecdotally this has had runoff from the site (including potential contaminants) enter it.</p> <p>Quantities of liquids stored are generally low.</p> <p>The nearest river to the Site is The Adur East (Goddards Green) (also named Holmbush Gill on mapping) flows east to west adjacent to the northern boundary of the site. There is one pond on site.</p> <p>No substantiated pollution incident to water, air, or land has been recorded within 250m of the Site.</p>	<p>Association (CIRIA) standard 736.</p> <p>Hardstanding is planned to be constructed (based on the recommendations of the CIRIA risk assessment) around the digesters.</p> <p>All transfer of digestate and material takes place under supervision and with flow rate control.</p> <p>All tanks undergo a delegated inspection regime and the process parameters are monitored and understood by Site operatives.</p> <p>Digestion tanks are built to appropriate standards and require appropriate bunding.</p> <p>There are currently six cake bays on-site, but this will reduce to two in the future as</p>	
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 etc. then abstraction.	Low	Medium	Low	<p>Watercourse must have medium / high flow for abstraction to be permitted, which will dilute contaminated run-off.</p> <p>No groundwater abstractions are present on-site.</p> <p>No substantiated pollution incident to water, air, or land has been recorded within 250m of the Site.</p>	<p>the planned THP will occupy approximately four cake bays. Cake is moved through the site via conveyors.</p> <p>Activities are managed and operated in accordance with the EMS. Spill procedures are in place under EMS363 and 364 as well as a pollution prevention procedure EMS360. All</p>	Low

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
Groundwater, land and surface water	<p>Spillages of liquids, contaminated rainwater run-off from wate e.g. containing suspended solids.</p> <p>Sludge/liquid spillages as a result of loss of tank/pipe integrity carelessness during transfer or overfilling</p>	<p>Chronic effects: contamination of groundwater, requiring treatment of water or closure of borehole or closure of abstraction intakes.</p> <p>Acute or chronic effects to aquatic life, contamination and deterioration of land and water quality.</p> <p>Pollution of water or land.</p>	Transport through soil/groundwater then extraction at borehole or intake.	Low	Medium	Low	<p>Potential for leaks from digestion tanks and storage vessels.</p> <p>Site infrastructure and hardstanding is generally in good condition.</p> <p>There are some grassed areas adjacent to the hardstanding which may enter the ground, including at a low point of the site in the south. The hardstanding and pavement across the key areas of the site is in good condition, with no cracks.</p> <p>Quantities of liquids stored are generally low.</p>	<p>spillages are recorded in the site diary including actions taken.</p> <p>The Site Manager ensures the programme of Planned Preventative Maintenance (PPM) is implemented effectively to minimise the probability of equipment malfunction.</p> <p>Control of substances hazardous to health (COSHH) assessments are undertaken for all raw materials.</p> <p>Both clean and contaminated surface water is directed to a pumping station which recirculates it back into the system.</p> <p>The surface 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.</p> <p>Regular inspections of the Site drainage systems and other equipment are undertaken, with any repairs and maintenance carried out, if necessary. All complaints and other incidents are recorded in the</p>	Low

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
								<p>site diary including actions taken.</p> <p>The condensate is clean, uncontaminated water and is small in quantity.</p>	
Groundwater, land and surface water	Spillages of sludge/liquids during transfer of imported and indigenous / unknown sludge and liquids from tankers.	<p>Acute or chronic effects: contamination of groundwater, requiring treatment of water or closure of borehole or closure of abstraction intakes.</p> <p>Acute or chronic effects to aquatic life, contamination and deterioration of land and water quality.</p> <p>Pollution of water or land.</p>	Transport through soil/groundwater then extraction/ abstraction at borehole or intake.	Low	Medium	Low	<p>Potential for spillage during transfer of liquid/sludge from tankers.</p> <p>Sludge is not currently imported into site, but this permit application seeks to include it. It will be imported in 20 tankers per day (at peak) and will be unloaded via a hose.</p> <p>Sludge cake is delivered in sealed containers and is tipped into the strain press. Cake is transported around the site via conveyors.</p>	<p>Impermeable surface required for storage of all waste.</p> <p>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.</p> <p>Established procedures are in place for the acceptance of tankered trade waste (EMS387), waste duty of care (EMS380), operational waste procedures (EMS381) and waste rejection (EMS488).</p> <p>Compliance with the waste duty of care requirements to ensure waste accepted meets the permit conditions and relevant legislation.</p> <p>All liquid run off will be captured in the drainage network and returned to head of works.</p>	Low

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
Groundwater, land and surface water	Flooding of site	If waste is washed off-site, it may contaminate 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. Area is not known to flood, and there have been no previous floods recorded on the Site.	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 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.	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 a Flood Zone 1 (less than 1 in 1,000 annual probability, and there have not been any reported flooding issues from the Site previously.	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 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	Low

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
								flood waters if an event was to occur.	
Local human population and / or livestock after gaining unauthorised access to the installation.	All on-site hazards: machinery, wastes and vehicles.	Bodily injury, death.	Direct physical contact.	Low	Medium	Low	<p>Potential injury to on-site personnel as a result of vehicle movements or equipment malfunction or misuse.</p> <p>Direct physical contact is minimised by activity being carried out within enclosed digesters so a low magnitude risk is estimated.</p> <p>Contact with waste is minimal with the exception of leaks or spills from unloading of tankers and transfer of filter cake.</p>	<p>Overall management of the site is overseen by an experienced member of staff holding an appropriate Certificate of Technical Competence (CoTC) awarded by the Waste Management Industry Training and Advisory Board. This competent person delegates responsibilities to appropriately experienced and trained site operatives throughout the operating hours.</p> <p>All operational staff are fully trained in the site operating procedures and Southern Water's safety and environmental management procedures and are kept up to date on changes.</p> <p>Training includes awareness raising of the potential on-site hazards and health and safety measures to adhere to.</p> <p>Preventative measures will be under continuous review as part of the EMS procedures.</p> <p>Activities are managed and operated in accordance with</p>	Low

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
								<p>the EMS – 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.</p> <p>The Site is fully enclosed by chain-link fencing approximately 6ft in height, and a 2.5-3m steel palisade at the 2m metal gate controlled via the control room or key fob. The site is staffed 14 hours a day, and the remaining 10 hours are covered by staff on standby. For visitors and unauthorised personnel an intercom system at the Site entrance is used.</p> <p>The Site also benefits from a CCTV system, there are eight CCTV cameras which comprise a combination of thermal imaging and number plate recognition. Two cameras cover the front gate (CCTV and ANPR), two cover the inlet (CCTV and thermal), two cover the large fuel tank and generator (CCTV and thermal) and two cover the hydrogen peroxide store under the archimedean screws. All cameras are</p>	

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
								<p>monitored and controlled from a control room. Site floodlighting is provided at all reception facilities to give good visibility at all times of the day and night.</p> <p>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.</p> <p>Key sludge treatment and wastewater treatment activities undertaken within enclosed systems.</p> <p>Vehicle movements around the Site vary depending on what activities are being undertaken. Cake is moved to cake bays once a trailer is full. Cake is removed from the bays daily by conveyor to the centrifuge building.</p> <p>Waste is removed, as required. Therefore, frequent vehicle movements are typically undertaken only by site staff and maintenance contractors.</p>	

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
								The Operator has produced hazard review and risk assessment documents relating to this and other types of potential incidents, within the EMS, H&S and O&M manuals.	
Local human population and local environment.	Explosion of biogas causing release of polluting materials to air (smoke or fumes), water or land	Respiratory irritation, illness and nuisance to local population. Injury to staff, fire fighters or arsonists/vandals. 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 WTW processes are undertaken within enclosed systems such as the AD and biogas systems. Sludge storage tanks are covered and enclosed. 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.	Low
Local human population and local environment.	Explosion of pressurised tanks due to equipment and/ or process failure.	Respiratory irritation, illness and nuisance to local population. Fatality/injury to staff, fire fighters.		Low	Medium	Low	Emissions to air, land or water may cause harm to and deterioration of air, land or water.	Slam shut valves on biogas lines will automatically close on detection of a fire to prevent any fuel being	Low

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
		<p>Potential for uncontrolled release of fugitive emissions of gaseous, liquid or solid materials to air, water or land.</p> <p>Acute or chronic effects to aquatic life, contamination and deterioration of land and water quality.</p>					<p>Smoke, fumes and material released from tanks may cause irritation, illness or nuisance to local residents and site staff.</p> <p>Impact from the tank explosion may cause external damages to other equipment, buildings located close to the epicentre of the explosion.</p>	<p>supplied to the CHP engines or boilers.</p> <p>Training and regular toolbox talks are given to operatives on-site and all operators and staff understand their roles in an emergency.</p> <p>The EMS includes procedures relating to maintenance and inspection of bunding of tanks.</p> <p>The Site Manager shall ensure the programme PPM is implemented effectively to minimise the probability of fire through faulty plant and equipment. All equipment is checked and calibrated as per the manufacturers' instructions.</p> <p>The THP process operates at high temperatures (up to 160°C) and high pressure (6 bar). All plant and materials are designed for this environment and fail safes are in place to prevent over heating or over-pressurisation of the system.</p> <p>Emergency operating procedures are in place.</p> <p>Adequate firefighting measures are implemented on-site.</p>	

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
								<p>The Site is fully enclosed by chain link fencing approximately 6ft in height, and a 2.5-3m steel palisade at the 2m metal gate controlled via the control room or key fob. The site is staffed 14 hours a day, and the remaining 10 hours are covered by staff on standby. For visitors and unauthorised personnel an intercom system at the Site entrance is used. The Site also benefits from a CCTV system, there are eight CCTV cameras which comprise a combination of thermal imaging and number plate recognition. Two cameras cover the front gate (CCTV and ANPR), two cover the inlet (CCTV and thermal), two cover the large fuel tank and generator (CCTV and thermal) and two cover the hydrogen peroxide store under the archimedean screws.</p> <p>All cameras are monitored and controlled from a control room. Site floodlighting is provided at all reception facilities to give good visibility at all times of the day and night.</p>	

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
								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.	
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 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	Medium	Low	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 activities 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 WTW processes are undertaken within enclosed systems Storage tanks are enclosed and covered. 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 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	Low

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
								<p>wet anaerobic digestion. However, fire prevention and environmental fire risk assessment procedures are provided in the EMS, H&S manual and Safety Instruction Book (SIB) (EMS362, H&S204, H&S440, and SIB603). There is also Safety zoning of areas under DSEAR/PEXA on site and smoking is only permitted in designated areas.</p> <p>Firewater is diverted through the drainage system to the head of the works allowing for contaminated fire water to be contained on site and treated through the wastewater treatment system.</p> <p>Training and regular toolbox talks are given to operatives on-site and all operators and staff understand their roles in an emergency. The EMS and Safety Instruction Book (SIB) includes procedures relating to maintenance and inspection of bunding of tanks, spills and environmental incidents.</p> <p>The Site Manager shall ensure the programme of</p>	

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
								<p>PPM is implemented effectively to minimise the probability of fire through faulty plant and equipment. All equipment is checked and calibrated as per the manufacturers' instructions.</p> <p>Emergency operating procedures are in place.</p> <p>Adequate firefighting measures are implemented on-site.</p>	
Local human population and local environment.	Arson and/or vandalism causing the release of pollution materials to air (smoke and fumes), water or land.	<p>Respiratory irritation, illness and nuisance to local population.</p> <p>Injury to staff, fire fighters or vandals/arsonists.</p> <p>Potential for uncontrolled release of fugitive emissions of gaseous, liquid or solid materials to air, water or land.</p> <p>Acute or chronic effects to aquatic life, contamination of land and water quality.</p>	<p>Air transport.</p> <p>Spillages and contaminated firewater by direct run-off from site across ground surface, via surface water drains, ditches etc.</p> <p>Indirect run-off via the soil layer.</p> <p>Transport through soil/groundwater then abstraction.</p>	Low	Medium	Low	<p>Emissions to air, land or water may cause harm to and deterioration of air, land or water.</p> <p>Smoke and fumes may cause irritation, illness or nuisance to local residents and site staff.</p> <p>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.</p> <p>Risk of accidental combustion of waste is minimal.</p> <p>Permitted waste types limited to sludges and liquids</p>	<p>The key sludge treatment and WTW processes are undertaken within enclosed systems such as AD and biogas systems.</p> <p>Storage tanks are covered and enclosed.</p> <p>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 qualifications.</p>	Low

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
								<p>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.</p> <p>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 (EMS362, H&S204 and H&S440). There is also Safety zoning of areas under DSEAR/PEXA on site and smoking is only permitted in designated areas.</p> <p>Training and regular toolbox talks are given to operatives on-site and all operators and staff understand their roles in an emergency. The EMS includes procedures relating to maintenance and inspection of bunding of</p>	

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
								<p>tanks, spills and environmental incidents.</p> <p>The Site Manager shall ensure the programme of PPM is implemented effectively to minimise the probability of fire through faulty plant and equipment.</p> <p>All equipment is checked and calibrated as per the manufacturers' instructions.</p> <p>Emergency operating procedures are in place.</p> <p>Adequate firefighting measures are implemented on-site.</p> <p>The Site is fully enclosed by chain link fencing approximately 6ft in height, and a 2.5-3m steel palisade at the 2m metal gate controlled via the control room or key fob. The site is staffed 14 hours a day, and the remaining 10 hours are covered by staff on standby. For visitors and unauthorised personnel, an intercom system at the Site entrance is used. The Site also benefits from a CCTV system, there are eight CCTV cameras which comprise a combination of thermal imaging and number</p>	

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
								<p>plate recognition. Two cameras cover the front gate (CCTV and ANPR), two cover the inlet (CCTV and thermal), two cover the large fuel tank and generator (CCTV and thermal) and two cover the hydrogen peroxide store under the archimedean screws..</p> <p>All cameras are monitored and controlled from a control room. Site floodlighting is provided at all reception facilities to give good visibility at all times of the day and night.</p> <p>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.</p>	
Local human population and local environment.	Operator Error.	Pollution to air, land, surface water and groundwater and human health	<p>Air transport</p> <p>Direct run-off from site across ground surface, via surface water drains, ditches etc.</p> <p>Indirect run-off via the soil layer.</p>	Low	Medium	Low	<p>Possible contamination to air, land, groundwater and surface water.</p> <p>Given the level of operator controls which are in place and management plans, it is considered the probability and magnitude will be low.</p>	<p>Activities to be managed and operated in accordance with the EMS and management plans and procedures implemented.</p> <p>All equipment is checked under preventative maintenance plans and is</p>	Low

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
			Transport through soil/ groundwater then abstraction.					<p>checked and calibrated as per the manufacturers' instructions.</p> <p>Overall management of the Site is overseen by an experienced member of staff holding an appropriate Certificate of Technical Competence (CoTC) awarded by the Waste Management Industry Training and Advisory Board. This competent person delegates responsibilities to appropriately experienced and trained site operatives throughout the operating hours.</p> <p>All operational staff are fully trained in the Site operating procedures and Southern Water's safety and environmental management procedures and are kept up-to-date on changes.</p> <p>Training includes awareness raising of the potential implications of failure to control operations and the potential impact on the environment.</p> <p>Preventative measures will be under continuous review as part of the EMS procedures.</p>	

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
								Emergency operating procedures are in place and detailed in the Site's Operational Contingency Plan. Senior site-based management have direct responsibility for implementing risk management measures.	

5 Reporting and Recording

5.1 Reporting

The procedure employed by Southern Water for reporting, recording, investigating and responding to incidents or breaches of the permit is the EPR notification procedure. Notifications must be made to the Environment Agency without delay and within 24 hours of the detection of an accident that has caused, is causing or may cause significant pollution or a breach of a limit specified in the Site's Environmental Permit.

If an incident with potentially significant environmental consequences occurs, Southern Water will notify the Environment Agency without delay. Southern Water will also inform the Environment Agency should any complaints be received directly to the Site due to the incident and will advise what remedial measures or actions have been taken to address the issue. Copies of complaints received will be made available to the Environment Agency for review on request.

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 typically 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 Environment Agency, followed by "Schedule 6, Part A Notification" by email or paper means. The Part A must be submitted within 24hrs of detection of failure. "Part B" notification would then follow giving supporting information as soon as practicable.

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

5.2 Recording

In the event of an accident, a Schedule 6 notification is completed following an incident with potentially significant environmental consequences. Relevant information that must be recorded includes:

- Date, time and location of the event
- Substances involved, including estimated quantities

- Immediate measures taken to minimise environmental impacts

Part A must be completed within 24 hours of detection of the incident and Part B is completed as soon as practicable. Records will be made of all incidents with potentially significant environmental consequences that occur at the Site. The associated actions arising will be held in Corporate Documents.

All records of events with potentially significant environmental consequences and the associated actions arising will be retained as required by the Environmental Permit. Where an incident with potentially significant environmental effects occurs, and the nature of the incident supports further investigation, a post incident review may be required.

5.3 Post-incident Review

Following an incident where potentially significant environmental effects occur, and the nature of the incident warrants it, the incident will be logged and an investigation will take place to determine both the root cause of the incident and how to prevent the incident re-occurring.

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

The findings of the investigation will be reported to Southern Water's management and shared with all relevant employees to enable the incorporation of good practice into future works.

Any changes to processes or procedures required as a result of the formal review will be communicated to Southern Water management and employees. If, as a result of the incident, this Accident Management Plan is subject to revision, it should be updated as part of this post-incident review and communicated to relevant Southern Water management and employees.

All safety equipment used to respond to an incident should be checked and replenished as required.

5.4 Competence and Training

Staff at the Site 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.

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 Works 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.

6 Emergency Response Procedures (ERP)

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
- Spill transferring wastes
- Spill transferring chemicals
- Sludge spillage on site
- 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

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

6.1 Fire

The Duty Operator on receiving either an automatic or a personnel-raised alarm will:

N/A	Done	Action
		Use the Model Fire Emergency plan on the H&S notice Board and in the Grab Pack container. This Model Emergency plan outlines responsibilities for site staff and call out staff during events.
		Raise the Site Alarm - call 999 and raise the alarm with the DM / RCC.
		SW rules are that we only fight fire to evacuate area or building.
		Attend the muster point and check register for any missing persons.
		If it is safe to do so, isolate any fuel sources.
		Make sure the fire brigade first response team are handed the Site Grab Pack on arrival.
		Liaise with the fire brigade on the area, mention if anyone is missing and confirm what is stored on site (e.g. chemicals, combustible materials, BIOGAS systems etc)
		Refer to plan of Fire Hydrants / Final effluent / Potable water points for use if required.

6.2 Explosion

N/A	Done	The Incident controller will: -
		Raise the Site Alarm - call 999 and raise the Alarm with the DM / RCC.
		Attend the muster point and check register for any missing persons.
		Make sure the fire brigade first response team are handed the Grab pack on arrival.

N/A	Done	The Incident controller will: -
		Liaise with the fire brigade on the area, mention if anyone is missing and confirm what is stored on site (e.g. chemicals, combustible materials, biogas systems etc – as per Sections above)
		Refer to plan of Fire Hydrants / Final effluent / Potable water points for use if required.

6.3 Pollution

The Duty Operator on receiving either an automatic or a personnel-raised alarm will:

N/A	Done	Action
		Use the Pollution 30 Minute Plan.
		Consider whether the pollution event can be mitigated or stopped - use the 10-minute checks. If it is safe to do so, isolate the equipment to stop the pollution, the consequence of isolating any equipment needs to be considered.
		If not raise the Alarm with the FEC / Process scientist in hours and DM / RCC/ FEC out of hours.
		Liaise with the FPM/ Process scientist in hours & DM / RCC/ FEC out of hours to reduce the impact.

6.4 Flooding

The Duty Operator on receiving either an automatic or a personnel-raised alarm will:

N/A	Done	The Incident controller will: -
		Use the Pollution 30 Minute Plan.
		Raise the site alarm – call 999 as soon as the site starts to flood and notify the DM / RCC.
		Attend the muster point and check register for any missing persons.
		If it is safe to do so, try to understand why the site is flooding. This may be obvious like the river is overflowing – the river levels are controlled by the Environment Agency so it may be possible to be managed quickly.
		Make sure the Fire brigade/first response team are handed the KFB Grab pack on arrival.
		Liaise with the fire brigade on the area, mention if anyone is missing and confirm what is stored on site (e.g. chemicals, combustible materials, biogas systems etc)

6.5 Road traffic accident impact or collision

The Duty Operator on receiving either an automatic or a personnel-raised alarm will:

N/A	Done	The Incident controller will: -
		Raise the Site alarm - call 999 and raise the alarm with the DM / RCC.
		Keep the area isolated, do not move vehicles other than for freeing people.
		Cordon off area if the impact or accident is serious.
		Await instruction from the fire brigade or police depending on the nature of the event.
		Please see plan of Fire Hydrants / Final effluent / Potable water points for use if required.
		For leaking tankers after the event (Fuel or Chemicals) put out spill containment if safe to do so.

6.6 Collapse of a structure or building

The Duty Operator on receiving either an automatic or a personnel-raised alarm will:

N/A	Done	The Incident controller will: -
		Raise the alarm - call 999 and raise the alarm with the DM / RCC.
		Attend the muster point and check register for any missing persons.
		Keep the area isolated, do not move debris other than for freeing people.
		Cordon off area if the collapse is serious.
		Await instruction from the fire brigade or police depending on the nature of the event.
		Please see plan of Fire Hydrants / Final effluent / Potable water for use if required.

6.7 Spill transferring wastes

The Duty Operator on receiving either an automatic or a personnel-raised alarm will:

N/A	Done	The Incident controller will: -
		Use the Pollution 30 Minute Plan.
		Stop the transfer if safe to do so and isolate if possible - complete Personnel Risk Assessment first.
		Contain the spill if safe to do so, using spill kits if small amounts, cover drains if possible
		Determine what has been spilt and where it has gone (i.e. to ground, to the site drains etc.)
		Report the incident to the FPM/DM/RCC.
		Discuss the impact of the spill with the FPM /Process Scientist/DM.

6.8 Spill transferring chemicals

The Duty Operator on receiving either an automatic or a personnel-raised alarm will:

N/A	Done	The Incident controller will: -
		Use the Pollution 30 Minute Plan.
		Stop the transfer if safe to do so and isolate if possible - complete Personnel Risk Assessment first.
		Contain the spill if safe to do so, using spill kits if small amounts, cover drains if possible
		Determine what has been spilt and where it has gone (i.e. to ground, to the site drains etc.)
		Report the incident to the FPM/DM/RCC.
		Discuss the impact of the spill with the FPM /Process Scientist/DM.

6.9 Sludge spillage on site

The Duty Operator on receiving either an automatic or a personnel-raised alarm will:

N/A	Done	The Incident controller will: -
		Spill from pipe <ul style="list-style-type: none"> • Isolate the sludge pipeline and either end. • Contain the spilled sludge with sandbags/barriers to prevent spread to the environment. • If the area has drains please check the site drainage plan to ensure these drain to the works return. If they do not or there is no plan assume they drain to the environment. In this case seal the drains to prevent sludge draining into it.

N/A	Done	The Incident controller will: -
		<ul style="list-style-type: none"> Depending upon the size of the spillage organise 1 x Supersucker and 1 x 4k tanker to assist with the clean-up. For smaller spills (with drains which lead to works return) it may be suitable for the operator to clean up themselves. Organise a framework contractor to repair the pipe (if above ground) or a dig down and repair if underground. If this is the only desludge route and cannot be bypassed ensure other options for controlling the sludge are put in place if the repair is likely to take >1 day. If the repair is likely to take >1 day instigated tankering from PST Tanks until the repair can be made

6.10 Overfilling vessels

The Duty Operator on receiving either an automatic or a personnel-raised alarm will:

N/A	Done	The Incident controller will: -
		Stop the transfer if safe to do so and isolate if possible - complete Personnel Risk Assessment first.
		Use the Pollution 30 Minute Plan.
		Contain the spill, if safe to do so, using spill kits if small amounts, cover drains if possible
		Determine what has been spilt and where it has gone (i.e. to ground to the site drains etc.)
		Report the incident to the FPM/DM/RCC.
		Discuss the impact of the spill with the FPM /Process Scientist/DM.

6.11 Plant and equipment failures

The Duty Operator on receiving either an automatic or a personnel-raised alarm will:

N/A	Done	The Incident controller will: -
		Stop the transfer or process if safe to do so and isolate if possible - complete Personnel Risk Assessment first.
		Use the Pollution 30 Minute Plan.
		Contain the spill, if safe to do so, using spill kits if small amounts, cover drains if possible
		Determine what has been spilt and where it has gone, including Biogas releases (i.e. release to ground, to the site drains or the atmosphere etc.)
		Report the incident to the FPM/DM/RCC.
		Discuss the impact of the spill with the FPM /Process Scientist/DM.

6.12 Containment failure

The Duty Operator on receiving either an automatic or a personnel-raised alarm will:

N/A	Done	The Incident controller will: -
		Stop the transfer or process if safe to do so by isolation - complete a personal Risk Assessment first.
		Use the Pollution 30 Minute Plan.
		Contain the spill, if safe to do so, using spill kits if small amounts, cover drains if possible
		Determine what has been spilt and where it has gone, including Biogas releases (i.e. release to ground, to the site drains or the atmosphere etc.)
		Report the incident to the FPM/DM/RCC.
		Discuss the impact of the spill with the FPM /Process Scientist/DM.

6.13 Failure to contain firewater

The Duty Operator on receiving either an automatic or a personnel-raised alarm will:

N/A	Done	The Incident controller will: -
		Use the Pollution 30 Minute Plan.
		Contain the firewater if it is possible to do so, use spill kits if small amounts, cover drains if possible
		Determine what amount has been spilt and where it has gone (e.g. site return WPS, to ground, to the site drains). Consider whether it can be contained and disposed of offsite.
		Report the incident to the FPM/DM/RCC.
		Discuss the impact of the spill with the FPM /Process Scientist/DM. – Process Scientist to risk assess impact.

6.14 Incorrect connection leading to releases to drains and other systems

The Duty Operator on receiving either an automatic or a personnel-raised alarm will:

N/A	Done	The Incident controller will: -
		Use the Pollution 30 Minute Plan.
		Contain the spill, if safe to do so, using spill kits if small amounts, cover drains if possible
		Determine what amount has been spilt and where it has gone, is it in the site return WPS, has the release been to ground to the site drains. Consider whether it can be contained and disposed of offsite.
		Report the incident to the FPM/DM/RCC.
		Discuss the impact of the spill with the FPM /Process Scientist/DM. – PS to Risk Assessment & impact.

6.15 Incompatible substances coming into contact

The Duty Operator on receiving either an automatic or a personnel-raised alarm will:

N/A	Done	The Incident controller will: -
		Use the Pollution 30 Minute Plan.
		Keep upwind of any potential fumes.
		Raise the Site alarm - call 999 if any fire or fumes are being generated, raise the Alarm with the DM / RCC.
		Discuss the impact of the spill with the FPM /Process Scientist/DM.
		Contain the liquid solution, if safe to do so, using spill kits if small amounts, cover drains if possible
		Determine what amount has been spilt and where it has gone (e.g. released to site return WPS, to ground, to the site drains). Consider whether it can be contained and disposed of offsite.
		Check the site COSHH register for both or all the components for likely reactions.

6.16 Emission of effluent or Biogas before composition checked

The Duty Operator on receiving either an automatic or a personnel-raised alarm will:

N/A	Done	The Incident controller will: -
		Use the Pollution 30 Minute Plan.
		Remember this emission may be a release of biogas to atmosphere. (We are not able to sample biogas).
		Sample the effluent if it is safe to do so and notify the FPM/ Process scientist of results.

N/A	Done	The Incident controller will: -
		Discuss the impact of the spill with the FPM /Process Scientist/DM for next steps.
		Report the incident to the DM/RCC/ SW Pollution team for Info.
		Stop the transfer if safe to do so and isolate if possible - complete Personnel Risk Assessment first.
		Contain the release if safe to do so, if there are spare containment tanks utilise these via discussion with Incident team.
		Stop the process, use site spill kits if small amounts have been spilt, cover drains if possible.
		Determine what has been released and where it has gone (e.g. to ground, to the site drains etc.)

6.17 Theft & Vandalism

The Duty Operator on receiving either an automatic or a personnel-raised alarm will:

N/A	Done	The Incident controller will: -
		Use the Pollution 30 Minute Plan if the vandalism has affected the process.
		Remember pollution emission may be a release of biogas to atmosphere or poor effluent quality or a release from a process or fuel storage vessel to land or a water course.
		Discuss the impact of the theft or vandalism with the FPM /Process Scientist/DM.
		Report the incident to the DM/RCC/ SW Pollution team for inclusion in the morning 24-hour report.
		Make a thorough inspection of the SCADA and a walk of the Site if we have had intruders or vandalism on the Site as changes may have been made to the process.
		Report any thefts or vandalism to the police and ask for a crime reference number.

A. Grab Pack