Environmental Site Management Plan

Accident Prevention and Management Plan: Mogden STW

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Using this standard

This standard is controlled and managed by EMS & Air and Waste Permitting Teams, and a copy is held on SharePoint at the following location: Environmental Management Systems

If you have any feedback please send this to: airandwaste.permitting@thameswater.co.uk

This standard works in combination with other corporate documents including the Asset Standards, Site Operating Manuals, site Odour Management Plans, Health and Safety Standards, and regulatory permits.

Document Control & Procedures

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0 Document Confidentiality

This document and its associated sections will only be disclosed to those of the recipient's employees and contractors who have a need to see it as part of their duties.

This document must be destroyed when the recipient has no further use for it or when otherwise requested to do so by Thames Water Utilities Limited (TWUL).

1 Glossary of Terms

TERM	DESCRIPTION
AD	Anaerobic Digestion
CHP	Combined Heat and Power
DEFRA	Department for Environment, Food and Rural Affairs
EA	Environment Agency
EMS	Environmental Management System
EPR	Environmental Permitting Regulations
FFT	Flow to Full Treatment
ICA	Instrumentation Control & Automation
IED	Industrial Emissions Directive
LNR	Local Nature Reserve
LWS	Local Wildlife Site
MPA	Marine Protection Area
NNR	National Nature Reserve
OCU	Odour Control Unit
OMC	Operational Management Centre
OMP	Odour Management Plan
PFT	Picket Fence Thickener
PM	Process Manager
PS	Pumping Station
PST	Primary Settlement Tank
Receptors	Sensitive receptors are any fixed buildings or installations where odour annoyance may occur, such as residential homes, schools, hospital, offices, shops or garden centres. Open areas such as playgrounds and public footpaths should also be listed where these are known to have been affected by odour.
SAC	Special Area of Conservation
SAP	Thames Water's enterprise resource and planning system
SCADA	Supervisory Control And Data Acquisition
SOM	Site Operating Manual
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
STW	Sewage Treatment Works
TW	Thames Water
UWWTD	Urban Waste Water Treatment Directive

2 Executive Summary

In accordance with the consolidated IED Environmental Permit for Mogden; Waste BAT, specifically BAT1; and associated written management systems, this is the site management plan covering accident prevention and management. Thames Water Utilities Ltd is required to review this plan at least every 4 years, unless there are incidents, operational or managerial changes at the site which would require an earlier review.

The prime function of the Mogden Sludge Treatment Centre (STC) at Mogden Sewage Treatment Works (STW) is to capture the energy potential from the treatment of sewage sludges. The plant is run 24/7 due to the continuous supply of sewage received at the treatment works either from the surrounding catchment, or via tanker discharge.

This document forms part of the Thames Water Environmental Management System (EMS) for the permitted STC within Mogden STW.

Thames 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.

This site management plan for accident prevention and management follows relevant guidance produced by the Environment Agency[1] and includes the following sections:

- This plan provides a list of off-site receptors (Section 4.2);
- This plan provides details of the potentially polluting substances located at the site (Section 4.3);
- This plan identifies potential accidents and states the likelihood and consequence of each accident (Section 5);
- This plan states the measures taken to avoid accidents and measures taken to minimise the impacts of accidents on the environment (Section 5);
- This plan outlines the reporting, recording and review steps to be taken should a potentially polluting incident occur (Section 6); and
- This plan includes reporting forms that should be used in the event of incident occurring (Appendix B).

3 Process Responsibility

The Operational Manager for the site has overall responsibility for reviewing the processes on the site to minimise the risk of accidents and reduce the impact of any such accidents that occur. This document is reviewed 4-yearly, but the review process is ongoing as part of the regular performance monitoring for the site. This plan was prepared in December 2023 and is next scheduled for review in December 2027.

4 Accident Prevention

In accordance with Thames Water's health and safety obligations and commitments, the STC is to be operated in a manner designed to reduce the risk of accidents to staff, the site and the wider environment.

[1] Guidance 'Develop a management system: environmental permits' published 1st February 2016, last updated 4th August 2021.

As part of the design process for any new plant or equipment on site, a HAZOP review is undertaken to ensure that the risk of accidents and their impacts is reduced through design. The site has been assessed under DSEAR and appropriate zoning applied, with clear signage indicating the zones.

Regular maintenance of the installation, is carried out in accordance the sites preventative maintenance programme, and the SOM. This ensures that the failures of plant are minimised over time and early remedial action implemented for any identified faults noted during maintenance.

4.1 Spill Prevention

The site is equipped with a number of spill kits and drain covers, located close to chemical and oil storage areas and tanks. Staff are trained in the use of these items to minimise the impact of spillages and risks to the works of chemicals or oils entering the site drainage system.

4.2 Off Site Receptors

The Mogden STW site is located within the Twickenham area of south-west London, an industrialised urban area consisting of residential, commercial and industrial premises. The site is bounded on all sides by residential or commercial premises but maintains a small vegetation buffer between the site assets and nearby receptors, who are mainly between 50 m and 100 m distance from the nearest asset.

The whole of the STW and STC is located within a Flood Zone 1 indicating that there is a low annual probability of river flooding (less than 1:1000 annual probability of flooding). The only exception to this is the Duke of Northumberland's River, an artificial channel that runs from south to north through the middle of the site towards the River Thames. This channel is considered to be in Flood Zone 3, with a high annual probability of flooding, greater than 1:100, however, this has not been known to flood outside of the channel and into the works.

The whole of the site sits outside of a Source Protection Zone but is situated within the Hounslow Air Quality Management Area (AQMA). The Hounslow AQMA was declared by the London Borough of Hounslow encompassing the entire Borough of Hounslow for nitrogen dioxide (NO2) - Annual Mean.

There are six designated habitat sites within the relevant distances of the site and 24 non-statutory designated Local Wildlife Sites within 2 km of the site. The nearest is a Local Nature Reserve (LNR), Isleworth Ait which is approx. 950 m north-east of the site. Syon Park, a Site of Special Scientific Interest (SSSI) is located approximately 1.5 km to the north-east and Ham Lands LNR is located approximately 2 km to the south-east of the site. Richmond Park Special Area of Conservation (SAC) is located approximately 3 km to the south-east and Wimbledon Park SAC is situated approximately 6.6 km to the south-east. Parts of the South West London Waterbodies, which is both a Ramsar site and Special Protection Area (SPA) can be found within 5 km and 10 km to the south-west of the site respectively. There are no Marine Protection Areas (MPA) within 10km of the site and no National Nature Reserves (NNR) or areas of Ancient Woodland habitat within 2 km of the site.

There are no protected habitat records within the specified screening distance of the site. There are however protected species records within the specified screening distance of the site, namely Bullhead, European eel and European eel migratory routes.

For habitat sites, the relevant distance for consideration are: International designations (SAC, MPA, SPA and Ramsar - 10km); National designations (SSSI – 2km); LNR and NNR, LWSs and Ancient Woodland (2km).

Designated site review

Site Name	Designation	Direction from site	Distance from site
Richmond Park	SAC	SE	3,000m
Wimbledon Park	SAC	SE	6,600m
South West London Waterbodies	Ramsar	SW WSW	5,300m 5,600m 9,600m
South West London Waterbodies	SPA	SW WSW	5,300m 5,600m 9,600m
n/a	MPA	n/a	n/a
n/a	NNR	n/a	n/a
Syon Park	SSSI	NE	1,500m
Isleworth Ait	LNR	ENE	9,50m
Ham Lands	LNR	SES	2,000m
n/a	Ancient Woodland	n/a	n/a
List of Local Wildlife Sites			
Crane Corridor Duke of Northumberland's River at Isleworth Duke of Northumberland's River at Woodlands Duke of Northumberland's River north of Kneller Road Duke of Northumberland's River south of Kneller Road Hounslow Loop Railsides Hounslow, Feltham and Whitton junctions Inwood Park Jersey Gardens			All sites <2,000m

Lampton Park Marble Hill Park and Orleans House Gardens Mogden Sewage Works Moor Mead Recreation Ground Osterley Park Piccadilly Line Railsides in Hounslow River Crane at St Margarets River Crane at St Margaret's (Richmond side) River Thames and tidal tributaries Royal Botanic Gardens, Kew Royal Mid-Surrey Golf Course Syon Park Tide Meadow at Syon Park Twickenham Junction Rough Twickenham Road Meadow	

4.3 Stored Substances

Site tank inventory

Name	Quantity	Volume (m3)	Total Operational Volume (m3)	Material
Primary Sludge Buffer Tanks	2	1,505	3,010	Steel
Sludge Import Tank	1	331	331	Steel
Thickening Sludge Buffer Tank	1	320	320	Steel
Pasteurisation Process (Consists of the following:				
12 x Pasteurisation Tanks (Each stream has 1 pre-heat tank, 1 reactor tank)	12	200	2,400	Steel
Pasteurised Sludge Buffer Tank	2	150	300	Steel
Primary Digester Tanks	16	4,125	66,000	Concrete
Digested Sludge Buffer Tank	1	520	520	Steel
Contingency Storage Tank	1	1,957	1,957	Steel
Overall Volume			74,838	
Primary Sludge Thickening Plant Poly Silo	1	15 tonnes		Steel
SAS Thickening Plant Poly Silo	1	30 tonnes		Steel
Sodium Hypochlorite Silo	1	42,000 litres		Not specified
Sodium Hydroxide Silo	1	42,000 litres		Not specified
Boiler House Diesel Tank	1	40,000 litres		Not specified

Diesel Tank	3	32,000 litres		Not specified
Standby Generator Diesel Tank	1	11,000 litres		Not specified

5 Assessment

Risk Matrix and Terminology for Accident for Risk Assessment

Likelihood ↓	Consequence		
	Low	**Medium**	**High**
Low	Low	Low	Medium
Medium	Low	Medium	High
High	Medium	High	High

Classification	Likelihood	Consequence	Risk
Low	Probability of an event is low and likely only to occur in the long-term (a yearly basis or less frequent).	Impact is low or a minor, short-term nuisance. Minor release to a non-sensitive receptor or pollution of water course. Non-permanent health effects to human health (preventable by appropriate PPE). Minor surface damage to buildings; structures; services; or the environment which can be repaired immediately.	A level of harm is possible although this may not be noticeable to a receptor and would be a short-term event without lasting effects. Level of harm can be reduced using industry best practice and appropriate management techniques.
Medium	It is probable that an event will occur periodically in the medium-term (twice yearly basis).	Impact is noticeable in the short to medium-term. Large release impacting on the receiving media killing flora and fauna and requires remediation. Nuisance causing non-permanent health effects to human health. Damage to buildings; structures; services; or the environment preventing short-term use and/or requiring repair.	A level of harm may arise to a receptor which is noticeable although not long-lasting and may require some remedial actions in order to prevent re-occurrences.
High	An event is very likely to occur in the short-term (monthly or weekly basis) and is almost inevitable over the long-term OR there is evidence at the receptor of harm or pollution.	Impact is significant, wide-ranging and long-lasting effect. Has a chronic or acute impact on human health. Very large release that has a major impact on flora and fauna which may be very difficult to remediate. Significant damage to buildings; structures; services; or the environment which prevents use long-term and may require complete replacement. May cause a long-term impact or contribute towards a global issue due to releases of greenhouse gases.	A level of harm is likely to arise to a receptor that is severe causing significant harm to human health or the environment without appropriate remedial and mitigation measures being implemented. Remedial works to infrastructure and processes is required in the long-term.

Activity/Hazard	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
Major fire and/or explosion causing the release of polluting materials to air, water or land.	Emissions to air and dispersion leading to inhalation by local human receptors. Respiratory irritation, illness and nuisance to local population Emissions to ground and ground water of digestate contaminating soil and/or groundwater. Run-off from site polluting surface water courses. Harm to aquatic flora and fauna and chronic effect on water quality. Injury to staff, fire fighters or arsonists/vandals.	Low	High	Medium	Follow site Incident Response Plan and inform relevant authorities. Management systems requires DSEAR assessment which is adhered to by site operations. Designated ATEX zones on site and lightning protection system in place around Propane tanks, Biogas Storage holders and Primary Digester Tanks. Fire alarm systems installed and maintained. Biogas and propane contained within closed systems and monitored for safety including a LDAR plan. Automatic cut off valve to biogas supply to stop biogas flows, electric temperature sensor, pressure monitors, flame arrestors, etc. Warning signs clearly displayed and staff wear biogas alarms to alert to the presence of biogas. All visitors subject to site inductions and accompanied. Permit-to-work system in place. Preventative maintenance programme and maintenance plans are in place in order to maintain equipment effectively. Smoking only permitted in designated areas of site.	Low
Minor fire causing the release of	Emissions to air and dispersion leading to inhalation by local human receptors. Respiratory irritation, illness	Low	Medium	Low	Follow site Incident Response Plan and inform relevant authorities.	Low

Activity/Hazard	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
polluting materials to air, water or land	and nuisance to local population Emissions to ground and ground water of digestate contaminating soil and/or groundwater. Run-off from site polluting surface water courses. Harm to aquatic flora and fauna and chronic effect on water quality. Injury to staff, fire fighters or arsonists/vandals.				Management systems requires DSEAR assessment which is adhered to by site operations. Designated ATEX zones on site and lightning protection system in place around Propane tanks, Biogas Storage holders and Primary Digester Tanks. Fire alarm systems installed and maintained. Biogas and propane contained within a closed system and monitored for safety including a LDAR plan. Automatic cut off valve to biogas supply to stop gas flows, electric temperature sensor, pressure monitors, flame arrestors, etc. Warning signs clearly displayed, and staff wear biogas alarms to alert to the presence of biogas. All visitors subject to site inductions and accompanied. Permit-to-work system in place. Preventative maintenance programme and maintenance plans are in place in order to maintain equipment effectively. Smoking only permitted in designated areas of site.	
Failure to contain firefighting water	Emissions to ground and ground water of contaminated firefighting water entering soil and/or groundwater. Run-off from site to surface water courses.	Low	Medium	Low	Follow site Incident Response Plan and inform relevant authorities. Site surfaces fall to the site drainage system which has been designed to sufficient capacity to contain firefighting water.	Low

Activity/Hazard	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
	Harm to aquatic flora and fauna. Chronic effect on water quality				Arrange for off-site tankering of firefighting water, if required. It is unlikely for run-off to leave site due to drainage and size of site. Run-off may impact upon the Duke of Northumberland's River channel depending upon the location of the fire and direction of travel for the firefighting water.	
Accidental explosion of biogas	Emissions to air and dispersion leading to inhalation by local human receptors. Respiratory irritation, illness and nuisance to local population. Injury to staff, fire fighters or arsonists/vandals. Pollution of water or land	Low	High	Medium	Follow site Incident Response Plan and inform relevant authorities. Management systems requires DSEAR assessment which is adhered to by site operations including a LDAR plan. Designated ATEX zones on site and lightning protection system in place around Biogas Storage holders, gas to grid plant and Primary Digester Tanks. Fire alarm systems installed and maintained. Biogas contained within a closed system and monitored for safety. Automatic cut off valve to biogas supply to stop gas flows, electric temperature sensor, pressure monitors, flame arrestors, etc. Lightning protection system installed. Likelihood reduced by availability of multiple on-site uses of biogas (combustion plant - three CHP Engines, three boilers and two Emergency Flares; biogas upgrade plant) and use of pressure release valves as a safety measure.	Low

Activity/Hazard	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
Significant leak of biogas to atmosphere	Emissions to air and dispersion leading to inhalation by local human receptors. Respiratory irritation, illness and nuisance to local population. Global warming potential of greenhouse gases.	Low	High	Medium	Site assets are protected by physical means to prevent vehicle strike by use of kerbing and barriers, and exposed pipework is guarded by barriers in places. Regular proactive and preventative maintenance including a LDAR plan and regular visual checks. PRVs are present to avoid over-pressurisation of biogas system. There is routine odour monitoring by twelve odour monitoring stations located across the site that continuously monitor atmospheric levels of hydrogen sulphide, feeding the results back through SCADA system which alert to the presence of H2S from a significant leak to atmosphere.	Low
Leaks of emission to air, but principally NOx.	Emissions to air and dispersion leading to harm to protected nature conservation sites – SSSIs, SAC and SPA. Harm to protected site through toxic contamination, nutrient enrichment, disturbance etc.	Medium	High	High	Site is located within an AQMA for NO2. The nearest designated protected habitat is a LNR approx. 950 m north-east of the site. A SSSI is located approx. 1.5 km north-east of the site and second LNR is approx. 2 km south-east of the site. Previous emissions modelling submitted shows that deposition and impacts on habitats sites are acceptable from an air quality perspective. There are no changes to emissions sources with this variation. Site operations will be subject to emission limits under current Regulations with infrastructure	Medium

Activity/Hazard	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
					designed to minimise uncontrolled releases. Checks, monitoring and preventative maintenance will further minimise fugitive emissions.	
Spillage of raw materials during (e.g. diesel, polymer, anti-foam) during use, transfer and disposal operations.	Emissions to ground and ground water of materials entering soil and/or groundwater. Run-off of liquids from site to surface water courses. Harm to aquatic flora and fauna. Chronic effect on water quality	Low	Low	Low	Raw materials are stored on made ground, within bunded containers or on bunds to contain spillages of 110% of the volume. Raw materials are generally stored away from the site water course. Regular inspections for leaks and damage, with remedial action as required. Contents of bunds are regularly checked during environmental audits and after periods of heavy rainfall and emptied as required. In event of a spillage, follow site spillage response plan and inform relevant site personnel. COSHH data sheets available. Deliveries to site are made by approved suppliers. Use of raw materials is carried out by trained personnel or automatically controlled processes. Penstock valves are fitted to bunded areas holding chemicals and used during the transfer process to isolate the drainage, e.g. ferric chloride delivery point. In the event of a minor spillage, spill kits are provided around the site which can be used to contain a spillage and direct it towards site drainage if suitable.	Low

Activity/Hazard	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
					Site drainage returns to works inlet providing treatment process for suitable materials or arrange off-site tankering of waste, if required. It is unlikely for run-off to leave site due to drainage and size of site.	
Spillage of sludges or liquid during tanker transfer operations e.g. pipework leaks	Emissions to ground and ground water of materials entering soil and/or groundwater. Run-off of liquids from site to surface water courses. Harm to aquatic flora and fauna. Chronic effect on water quality	Low	Low	Low	All pipework is standardised, including tanker couplings. Both of the tanker offloading area at the inlet are of concrete construction with kerbing, bunding and drainage to prevent release to ground. In the event of a spillage, follow site spillage response plan and inform relevant site personnel and relevant authorities. Spill kits are provided around the site which can be used to contain a spillage and direct it towards site drainage. Site drainage returns to works inlet providing treatment process for sludge or arrange off-site tankering of waste to another site. Sludge is relatively viscous and not highly mobile.	Low
Spillage of sludges (e.g. primary sludge, SAS, digested sludge) during processing and transfer operations e.g. tank	Emissions to ground and ground water of materials entering soil and/or groundwater. Run-off of liquids from site to surface water courses.	Low	Low	Low	Processing and transfer operations of waste materials is largely an automatic process controlled by the Process Controllers and parameters set within the SCADA system. Tanks are fitted with sensors linked to SCADA to monitor levels within a tank and can inhibit additional	Low

Activity/Hazard	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
overtopping, pipework leaks	Harm to aquatic flora and fauna. Chronic effect on water quality				pumping if high alarms activate. Tanks are mainly covered. Preventative maintenance programme and maintenance plans are in place in order to maintain equipment effectively and minimise the risk of spillages. In event of a spillage, follow site spillage response plan and inform relevant site personnel and relevant authorities. Spill kits are provided around the site which can be used to contain a spillage and direct it towards site drainage. Staff are trained in their use. Site drainage returns to works inlet providing treatment process for sludge or arrange off-site tankering of waste to another site. Sludge is relatively viscous and not highly mobile. It is unlikely for run-off to leave site due to drainage and size of site.	
Failure of sludge storage tanks / digester tanks	Emissions to ground and ground water of materials entering soil and/or groundwater. Run-off of liquids from site to surface water courses. Harm to aquatic flora and fauna.	Low	Medium	Low	Follow site Incident Response Plan and inform relevant authorities. Regular infrastructure inspections for tanks and pipework and planned preventive maintenance system in place. Regular visual inspections for tanks and pipework where this is aboveground and visible, and reactive maintenance. In-line flow monitoring in key locations and tank level monitoring would identify losses and enable a quick	Low

Activity/Hazard	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
	Chronic effect on water quality.				response. Tanks are found on made ground which is connected to site drainage which returns to works inlet. Tanks are located away from the site water course and is relatively viscous and not highly mobile limiting the distance it can spread in a short time period. It is unlikely for run-off to leave site due to drainage and size of site.	
Acceptance of non-conforming wastes and wastes that are incompatible with the waste treatment process	Impacts on the normal performance of site treatment processes leading to emissions to ground and ground water contaminating soil and/or groundwater. Harm to aquatic flora and fauna and chronic effect on water quality. Harm to aquatic flora and fauna	Low	Medium	Low	Waste materials subject to waste pre-acceptance checks prior to delivery to site and subject to waste acceptance checks prior to discharge. Site has physical security measures to prevent unauthorised access to the site and all discharge points. Waste can only be accepted at the site if it is suitable for the biological treatment process. Site processes are monitored automatically with alarms to alert staff in the event of abnormal situations. Staff conduct regular monitoring of all plant and equipment during routine site activities.	Low
All on-site hazards: machinery	Direct physical contact with human population and /or livestock after gaining unauthorised access to the installation	Low	High	Medium	Direct physical contact is minimised by activity being carried out within enclosed Primary Digester Tanks. Site activities are managed and operated in accordance with a management system. Site physical security measures, including site security	Low

Activity/Hazard	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
	Bodily injury				personnel and Thames Water staff on site 24/7, perimeter fence, CCTV and access control to prevent unauthorised access. Assets are protected by various physical means including fencing, kerbing and bollards to prevent vehicle strikes. Vehicles equipped with reversing alarms. Use of banksmen as appropriate.	
Vandalism causing the release of polluting materials to air (smoke or fumes), water or land.	Emissions to air and dispersion leading to inhalation by local human receptors. Respiratory irritation, illness and nuisance to local population Emissions to ground and ground water of digestate contaminating soil and/or groundwater. Run-off from site polluting surface water courses. Harm to aquatic flora and fauna and chronic effect on water quality. Injury to staff, fire fighters or arsonists/vandals.	Low	High	Medium	Unauthorised access is unlikely to happen and minimised by physical site security measures and effective management systems. Site has site security personnel and Thames Water staff on site 24/7, perimeter fence, CCTV and access control barrier entry for all vehicular access. Additional security fences around some assets and other assets are kept within locked containers or buildings. Warning signs are displayed.	Low

Activity/Hazard	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
Flooding from rivers, streams and groundwater	Emissions to surface water course and harm to aquatic flora and fauna. Infiltration to ground and groundwater. Harm to aquatic flora and fauna and chronic effect on water quality.	Low	Medium	Low	The Mogden STC is within a Flood Zone 1 with a low likelihood of flooding. General wider works designed to minimise risk of localised works flooding due to storm surges. Potentially polluting substances stored within suitable containers and provided with bunds to contain spillages. Follow site Incident Response Plan and inform relevant authorities. Take appropriate corrective and preventative actions to minimise environmental impact	Low
Flooding due to drain blockages and/or excessive rainfall causing localised on-site surface water flooding	Emissions to surface water course and harm to aquatic flora and fauna. Infiltration to ground and groundwater. Harm to aquatic flora and fauna and chronic effect on water quality.	Medium	Low	Low	Site wide drainage system linked to main sewage works, which includes additional capacity in storm tanks within the works to manage additional flows. Follow site Incident Response Plan and inform relevant authorities. Take appropriate corrective and preventative actions to minimise environmental impact. It is unlikely for run-off to leave site due to drainage and size of site.	Low
Loss of mains power leading to failure of pumps / control systems and	Emissions to ground and ground water of materials entering soil and/or groundwater. Run-off of	Low	Medium	Low	Site CHP Engines able to supply electricity to the site using biogas supplies on site. Multiple back-up emergency standby generators provide back-up power / contingency plans to the STW and provide	Low

Activity/Hazard	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
possible leaks and escape of sludge.	liquids from site to surface water courses. Harm to aquatic flora and fauna.				power to critical operations in the event of an electrical outage. Failsafe systems in place to ensure sludge remains in situ in the event of a loss of power and that systems are promptly returned into operation. Site wide drainage system linked to main sewage works in the event of a spillage.	
Vandalism	Damage to plant or equipment on site due to unauthorized access to the site.	Low	Medium	Low	Site accessed restricted at all times, including electronically controlled gates and 2 metre fencing. CCTV present at site. During normal operating hours, there is a culture of challenge around non-staff on site.	Low
Extreme weather conditions leading to abnormal conditions / release of potentially polluting substances	Emissions to air and dispersion leading to inhalation by local human receptors and impacts on local ecological receptors. Respiratory irritation, illness and nuisance to local population. Harm to flora and fauna. Emissions to ground and ground water contaminating soil and/or groundwater. Run-off from site polluting surface water courses. Harm to	Low	Medium	Low	The treatment process can be controlled from off-site locations in the event of the site being inaccessible due to extreme weather e.g. snow, flooding. Storage tanks for potentially polluting substances have been designed to relevant industry standards at the time of construction. Lightning protection is installed at relevant locations to protect assets from lightning strike. Potentially polluting substance are stored in accordance with MSDS requirements and away from sensitive receptors.	Low

Activity/Hazard	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
	aquatic flora and fauna and chronic effect on water quality.				Follow site Incident Response Plan and inform relevant authorities. Take appropriate corrective and preventative actions to minimise environmental impact.	

6 Reporting and Recording

6.1 Reporting

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

Details of the information that should be reported to the Environment Agency are found in the most recent variation of the site's Environmental Permit but is reproduced as Appendix B of this document.

6.2 Recording

The procedure employed by TWUL for 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.

In the event of an accident, a Schedule 5 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; and
- Immediate measures taken to minimise environmental impacts.

A copy of the Schedule 5 notification form is provided in Appendix B. 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 installation. The associated actions arising will be held on SharePoint. 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.

6.3 Post-incident Review

Following an incident where potentially significant environmental effects occur, and the nature of the incident warrants it, an investigation will take place to determine both the root cause of the incident and how to prevent the incident reoccurring. The findings of the investigation will be reported to TWUL's management and shared with all relevant employees to enable the incorporation of good practice into future works.

A formal 'event learning' review of all on site processes and procedures will be undertaken by TWUL following any incident with potentially significant environmental consequences, if the processes are determined to be contributory to the cause of the incident. Any changes to processes or procedures required as a result of the formal review will be communicated to TWUL 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 TWUL management and employees.

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

6.4 Contacts

The key emergency contacts in the event of an accident or inicident are:

Contact	Number
Thames Water Utilities Limited **Customer Services**	08459 200800
Environment Agency	0800 807060 (incident number) 03708 506506 (normal number)
Emergency services	999

Appendix A

Site Specific Key Contacts

Role	Name	Email address	Phone Number
Area Operations Manager			
Site Performance Manager			
Technically Competent Manager			
Customer Centre			
Thames Water Environmental Compliance Manager			
Thames Water Health and Safety Manager			

Appendix B

Notification Forms

To be inserted from relevant permit document.