



Acceptance of TWUL Inter-Site Sludge, Cake and Sludge Liquors



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Key messages

Thames Water’s 25 Sludge Treatment Centres (STCs) operate under IED EPR Permits which set out specific conditions on how the permitted activities must be carried out, including restrictions on the types of waste which can be handled and accepted.

This Standard defines the working practice to be adopted at each of the 25 STCs to ensure the correct acceptance of inter-site sludge and cake imports, based on two levels of waste verification.

- Waste Pre-acceptance (Section 5); and
- Waste Acceptance (Section 6).

This Standard also includes instruction on the reasonable steps to be taken to ensure that duty of care is fulfilled.



Roles and Responsibilities

Senior Management



Bio-Recycling Team



Include standard requirements for management of inter-site sludge and cake movements in line with this Standard

Site Operations



Thames Water Laboratory



1 Purpose



Thames Water is the operator of 25 Sludge Treatment Centres (STCs), each of which has an IED EPR Permit that allows imports of inter-site sludge and inter-site sludge cake waste.

The IED EPR Permits allow Thames Water (TWUL) to accept non-hazardous sludges, sludge cake and/or liquor, or liquid sludges from water clarification for treatment and / or storage at each of the 25 STCs at waste reception points design for the purpose. These activities must comply with the requirements of each of the respective IED EPR Permits. Note: the import of inter-site sludge to head of works waste reception area is exempt under Controlled Waste Regulations 2012 Regulation 3, 2(a) and this activity is outside the scope of the permit

Each STC IED EPR permit sets out specific conditions on how permitted waste operation must be carried out. This include restrictions to the types of waste that can be handled. A breach of permit could include accepting or managing a waste which the permit does not accept.

IMPORTANT This generic EMS procedure **MUST** be read in conjunction with your **site IED AD Environmental Permit and 'Appendix 1' of this document 'Site Specific Information'**.

Waste import activities listed in this document can only be carried out if listed in the sites permit.

This procedure is applicable to the following types of TWUL imported non-hazardous sludges, sludge cake and liquor from waste treatment processes and sludges from water clarification:

- Raw Sludge (Un-thickened and thickened)
- Raw Cake (dewatered raw sludge)
- Digested Sludge Cake (dewatered digested sludge)
- Sludge Liquors
- Liquid sludges from water clarification

Note: Appendix 1 highlights those TWUL Inter-site waste activities that have are not permitted at certain sites and therefore activities listed in the document that are not authorised at all sites.

Example: Not all TWUL sites are permitted to import raw sludge cake for treatment and / or digested sludge cake for storage.

IMPORTANT: The site permit should always be read in conjunction with this document and as the primary source of confirming the Waste Activities and EWC codes each site is authorised to carry out / accept – please see Table 1 in this document for TWUL descriptors applicable to each EWC.

This document sets out TWUL current working practices used to ensure compliant acceptance of waste at our sludge treatment centres based on two levels of waste verification, namely:

- Waste Pre-acceptance (Section 5); and
- Waste Acceptance (Section 6).

The Standard also covers the acceptance of sludge cake transfer between STC's, for the purposes of its storage and / or further treatment (see section 5) prior to transfer offsite for recycling to land under BAS.

The permitted wastes suitable for acceptance at the Inter-Site Liquid Sludge Reception Point(s), and the cake pad(s), at each of the 25 STCs are listed in each of the respective IED EPR permits, which

are available on the Thames Water SharePoint EMS Portal via the 'My Sites and EMS' pages for each of the permitted STCs. (see also Table 1 below)



The requirements of this Standard must be communicated to all relevant employees and subcontractors, who must include the relevant control measures in method statements and risk assessments. Relevant Toolbox talks should be undertaken to communicate requirements on an on-going basis. This must include any developments to this Standard.

2 Scope



The scope of this Standard covers all persons, techniques, assets and operations associated to, and/or included within each of the IED EPR Permits for the 25 STCs that relate to the acceptance of inter-site sludge, sludge cake and liquors.

The boundary of the site of asset is defined as detailed in f the 25 Sludge treatment permits. Health and Safety Standards and Asset Maintenance Standards also apply across all 25 STCs.

3 Duty of Care



Thames Water has a legal duty, under Section 34 of the Environmental Protection Act 1990, often referred to as The Duty of Care, to ensure that any liquid or solid waste is disposed or recovered in the correct manner, without harming human health or the environment.

Responsibility for the compliant storage, treatment and recovery (or disposal) of waste sludge from UWWT and permitted Sludge Treatment centres lies with TWUL as the waste producer, permit holder and 'waste holder'.

TWUL must take all reasonable steps to ensure the Duty of Care is fulfilled including ensuring:

- waste sludge has been adequately described.
- waste sludge is securely contained to avoid its escape into the environment.
- ensuring that Thames Water is a registered waste carrier authorised to carry waste; and that
- that necessary waste transfer note documentation is kept

Waste must be managed in a way to ensure that its handling:

- Complies with relevant legislation and site-specific permit requirements.
- Does not cause harm to the environment and/or human health;
- Does not cause a nuisance; and
- Does not adversely affect public amenities or ecological receptors.

3.1 Waste Classification and Duty of Care Records

Thames Water transports our own 'inter-site' liquid waste. All movements of inter-site liquid sludge waste will be recorded and inter-site liquid sludges are discharged via a 'WASP' loggers in the waste reception areas. When logging on for a deposit using the unique issued fob, the TWUL fleet tanker driver type before discharging the waste. The data from each transaction is then stored in the WASP system. This system uses TWUL waste descriptors which are aligned to the 'List of Waste Codes'

(EWC's) listed in Environment Agency Guidance RPS 231 'Waste codes for sewage sludge materials: see Table 1.

The waste import logger will track the information submitted in real time. For each import of inter-site liquid sludge waste, the following details must be recorded:

- Time, date and place of transfer;
- Volume of transaction;
- Vehicle registration number.
- Source of waste;
- Description of the waste;

The WASP system will store inter-site liquid sludge import data for the lifetime of TWUL Sludge Treatment Centre permits. Transactions recorded on WASP are reviewed by the Bio-Recycling Team for compliance checks and as and when for reporting purposes, for example Environment Agency Quarterly Waste Returns at permitted sites.

Table 1: RPS 231 Sewage Sludge EWC codes vs TWUL descriptors and sludge characteristics

Description	TWUL Internal descriptor	List of Waste (EWC code)	Typical Dry Solids (DS) content
Raw Sludge (very thin sludge)	LIQ	19 08 05	<4.5% DS
Raw Sludge (thickened / dewatered)	RAW; ACT	19 02 06	1.5% -10% DS
	RCK (Raw Cake)	19 02 06	>18% DS
Digested Sludge Cake	DCK; DIG	19 06 06	> 18% - 40% DS
Treated Sludge – Lime stabilization	TLP	19 02 06	>18% - 40% DS
Raw Sludge Mechanically treated no polymer	N/A	19 12 12	>18% DS
Sludge liquors*	SLQ	16 10 02	<1.5% DS
Sludges from water clarification (liquid sludge)	-	19 09 02	<5% DS

*liquors are included in this table but not in RPS231. Instead, 16 10 02 appears in RPS 241 as new code for 19 08 99. Similarly sludges from water clarification are a specific entry in WM3.

Inter-site Cake (RAW or Digested)

For inter-site transfers of cake, cake transfer will utilise TWUL operated tipper lorries. On board weighing devices are used to determine the quantity of waste delivered by each individual load. This data supports Annual Waste Transfer Notes retained for Duty of Care and informs TWUL reporting such as again Environment Agency Quarterly Waste Returns at permitted sites.

4 Import areas: Inter-Site Liquid Sludge, Liquors and Cake



Each STC utilises one or more of the following waste reception areas to receive inter-site sludge and inter-site cake (see individual site 'Layout Plans':

1. 'Cess' / Liquid Waste Import Waste Reception Area discharging 'liquid sludge' / liquors to STW Head of Works and the UWWT process.
2. Liquid Waste Sludge Import Point - receiving waste directly to the permitted Sludge Treatment process.
3. Raw Cake Import Reception building - receiving waste directly to the permitted Sludge Treatment process or to an on-site storage area prior to treatment as required.

Thames Waters waste reception areas are constructed and maintained in accordance with the requirements set out in TWUL Asset Standards. TWUL operates a maintenance programme for these assets and all ancillaries, which is managed by the Site Operations Team. These areas are identified on each permitted sites 'Installation permit boundary plan and emission point plan'

5 Inter-Site Digested Cake Import Areas



The Inter-Site Cake Import areas, are designated areas on the site cake pad(s) which have been allocated for the storage of cake for import. The precise area will be at the discretion of the Site Operations Team, based on the storage requirements for indigenous cake at the site at the time of the proposed transfer.

Non-indigenous digested cake imported to site must be stored separately from indigenous sludge cake on the pad in separate clearly marked bays to indicate its status and be regularly monitored until such time as it is utilised.

6 Waste Pre-acceptance



Inter-site Sludge

Thames Water's 25 STCs only receive inter-site sludge produced at other TWUL sites. All movements of inter-site liquid sludge are undertaken by TWUL's own fleet of tankers under the management of the Bio-Recycling Team

All TWUL inter-site sludges are biological sludges that derive from TWUL UWWT streams. Only indigenous and non-indigenous sludge described in Table 1 are accepted to the permitted biological treatment process. We do not currently accept waste any waste that would result in co-digestion.

Thames Water therefore has control of the sludge stream as 'waste holder' from point of production, through to acceptance and treatment at each of the 25 STCs. TWUL is the waste producer and 'Waste Holder' throughout.

The principal sources of Thames Water UWWTD inter-site liquid sludges processed at the 25 STCs locations and listed in Table 1. are:

- Primary Sludge : Sludge from primary settling tanks, generally 75% organic content or higher;
- Chemical-Precipitation Primary Sludge: Sludge from primary settling tanks that has been dosed with iron salts to aid phosphorous removal, generally 70% organic in content or higher;
- Waste or Surplus Activated Sludge : Excess sludge from the activated sludge process, comprising mainly of the residual bacteria from the process, generally 75% organic content or higher;
- Humus Sludge : Sludge settled following trickling filters, generally 75% organic content or higher; and
- Sludge Liquors : Liquor with less than 1% solid matter from sludge treatment.

Inter-site liquid sludges received are typically in the range of 1% to 8% dry solids, with the majority being between 3.5% and 6% dry solids (see specific examples in Table 1).

As the sludge is coming from other TWUL sites, this allows TWUL to have the knowledge in understanding the nature of the process producing the waste, including the variability of this process and therefore have a deep understanding of the likely composition of the waste based on the performance and processes of the producing works prior to undertaking a full pre-acceptance assessment. This also allows the control and assurance of our Sludge imports, their characteristics and suitability as inter-site sludges from TWUL UWWT for treatment at the TWUL permitted Sludge Treatment Centres.

Operators of AD plants must characterise the feedstock to understand its effect on the biological treatment process as follows:

Table 2: Waste Characterisation and effect on Biological Treatment

Types of Thames Water imported sludge/cake	Biological Treatment Comments
Primary sludge	Highly digestible – higher VS content
Chemically Precipitation Primary Sludge	Highly – lower VS content
Co-settled Primary + Humus	Highly digestible – higher VS content
Co-settled Primary + SAS	Good digestion – be aware of SAS content
Waste or Surplus Activated Sludge	Poor digestion – high nitrogen content (will affect dewaterability)
Humus Sludge	Highly digestible

Sludge liquors	Volume but very little load
Raw cake	Feed into Thermal Hydrolysis Process (THP)
Digested Cake - compliant	Post digestion – for storage only
Digested Cake – non-compliant	Post digestion – stored separately until treated or until becomes compliant

Inter-site Sludge and RAW Cake - Pre acceptance Characterisation

TWUL will undertake characterisation and classification /of inter-site sludge and raw cake in accordance with Appropriate Measures Biological Treatment of Waste and RPS231 (see Table 1). This is to ensure that sludges are assigned the correct EWC code and that they are suitable for Biological Treatment. This information will be captured in a “Waste Pre-acceptance schedule” appended to the Annual Transfer Note.

In order to characterise the inter-site sludges and imported raw cake, TWUL propose to undertake a sampling programme which will consists of 10 samples per sludge type, of sludges produced across TWUL 350 sites.

Samples will be taken following the TWUL Sampling Procedures Manual Section 10 and sent to UKAS accredited laboratory for analysis for the following determinants:

- particle size and physical contaminants
- total solids and volatile solids
- biogas potential
- chemical oxygen demand (COD)
- pH
- volatile fatty acids (VFA)
- ammonia and total nitrogen content – carbon to nitrogen (C to N) ratio
- heavy metals and potentially toxic elements (PTEs)

Note that not all parameters listed may be appropriate for the source import for example for TOC, Alkalinity, Nutrient Analysis, Fibre content. In Biological UWWT sludges these items are in a range which is not of concern to digestion

Following receipt of the analysis results, these will be assessed against the suitability for Biological Treatment thresholds detailed in Table 2, and the inter-site sludge / raw sludge cake assessed as suitability or not for Biological Treatment.

Expected range for parameters which are deemed acceptable for the UWWT process are listed below:

▪ **Table 3: Suitability for Biological Treatment**

Determinant	Acceptable Level (Minimum)	Acceptable Level (Maximum)	Units
Particle size and physical contaminants	No particles (foreign objects) larger than 10mm in size		
Total solids– Liquid sludge	0.25%	10.0%	dry solids weight/weight
Total solids– Raw cake	10.0%	40%	dry solids weight/weight
Volatile Solids	50%	100%	volatiles solids/total solids weight/weight
Biogas potential	150	600	Nm3 biogas/tds feed
Chemical oxygen demand (COD)	0	200,000	Mg/litre
Total organic carbon (TOC)	Under Review		
Nutrient analysis	Under Review		
pH	4.0	10.0	pH units
Volatile fatty acids (VFA)	0 – 12,000 mg/l		
Ammonia	0 – 5,000 mg/l		
Carbon to nitrogen (C:N ratio)	-	Under Review	N/A
Total N – Primary Sludges	1.0%	7.0%	nitrogen per total solids weight/weight
Total N – Activated Sludges	3.0%	12.0%	nitrogen per total solids weight/weight
Total P	No minimum	10 %	phosphorous per total solids weight/weight

Zn	Under Review*	Under Review*	mg/kg
Cu		Under Review*	
Ni		Under Review*	
Cd		Under Review*	
Pb		Under Review*	
Cr		Under Review*	
Hg		Under Review*	
Mo		Under Review*	
As		Under Review*	
Se		Under Review*	
F		Under Review*	

Note: parameter ranges to be informed by development of 'typical' values. *PTE/Metals values noted as 'Under review' as requested by the Environment Agency - June 2023.

Pre acceptance - Inter-site Digested Sludge Cake.

Thames Water's Bio-Recycling Team also operates under a management system that is certified to the ISO9001:2015 & ISO14001:2015 standards and the Biosolids Assurance Scheme (BAS). Within the Quality and Environmental Management System, procedures are in place to cover all aspects of the operation including:

- the completion of BAS Source Material Risk Assessments;
- product sampling to ensure compliance with regulations; and,
- routine process testing*, (see Table 2)

*process testing on commissioning of new plant to ensure that the treatment process meets all the requirements of the Hazard Analysis and Critical Control Point (HACCP) standard and will produce a product suitable to be sent to land.

The Thames Water Bio-Recycling Team's documented procedure entitled 'TWUL Procedure to Ensure Satisfactory Sludge Compliance' describes the methods employed to ensure sludge compliance.

Digested cake moved between TWUL sites for storage in a contingency will meet BAS requirements.

Waste Pre acceptance Records

For each sludge type, classification and characterisation will be captured in a “**Waste Pre-acceptance schedule**” which will be appended to a ‘Annual Waste Transfer Note’ to include site specific details including:-

- characterisation information from the above assessment to confirm suitability for Biological Treatment
- waste source details, waste description and EWC classification.
- the quantity of waste expected per annum
- the planned collection frequency / age of waste
- odour potential

As all sludge imported for digestions is from TWUL works, there is no anticipated reason as to why the sludge should not be suitable for Biological Treatment, however, if a sludge is found to be outside the parameters detailed in Table 2, further checks will be undertaken to identify any reason for the sludge not being suitable and it will not pass the pre-acceptance checks until further sampling is undertaken and the assessment of these samples passed the pre-acceptance criteria.

The works operator will be notified of any sludges that do not pass pre-acceptance checks so that further on-site investigations can be undertaken, and appropriate measures taken for the disposal of that sludge load.

Periodic sampling will be arranged following the baseline pre-acceptance sampling programme. This sampling will be carried out at an appropriate frequency for each site. (see Section 7, Monitoring and Periodic Sampling)

Operationally, sludges are only accepted from sites where the effluent stream and resultant sludge stream is healthy as indicated by TWUL monitoring of the UWWT processes at each STW. Should this not be the case sludges from those streams would be handled separately, and an assessment undertaken to determine the appropriate course of treatment.

Staff responsibilities and training

As detailed in the roles and responsibilities flow chart, the bio-recycling team are responsible for undertaking pre-acceptance checks. As part of the TWUL management systems, training will be developed for relevant staff carrying out pre-acceptance assessments. A training matrix will determine the training required (based on staff role/responsibilities) and records will be kept for each staff member to demonstrate the level of training undertaken and provide evidence to demonstrate competence of staff undertaking waste pre-acceptance checks.

Records will be available as required.

7

Waste Acceptance



Inter-site Sludge

The unbroken custody chain set out in above (Section 6 - Waste Pre-Acceptance) ensures the provenance and characteristics of the waste to be accepted at TWUL Sludge treatment centres as being that of sludge derived from TWUL owned and operated UWWTD processes.

Collections of TWUL inter-site sludge are arranged on a daily basis and are dependent on the daily sludge capacity requirements of the receiving works. Procedures are in place so that the capacity of the receiving works is checked. Only works with available capacity are booked in for delivery from the TWUL tankers collection rounds.

An MS forms system is in place that allows any capacity changes to be identified and notifications to be sent to advise if a Sludge Treatment Centre (STC) does not have capacity to receive sludge or if it has additional capacity. This allows effective management of sludge streams to ensure sludge is only sent to an STC with available capacity,

Waste Acceptance Checks

TWUL tanker drivers will undertake visual checks of each load of inter-site sludge (incl. sludge liquors) at the site of origin as part of loading to process to confirm that the sludge is as expected and there are no obvious signs of contamination or any reason why the sludge would not be accepted at the destination site.

If the sludge passes the visual checks, it will be loaded and delivered to the destination site where upon discharge in a Liquid Sludge Import Area (see Section 4) it will be monitored for the parameters in Table 4 using the WASP loggers:

Table 4: Waste Acceptance Monitoring – Liquid sludge

Parameter	Unit	Frequency	Method
Sludge Type		Each transaction	Visual / Paperwork Records
Volume	Litres or m3	Each transaction	Import Logger / WASP
Dry Solids	%	Each transaction	Import Logger / WASP

Waste Acceptance records

When logging on for a deposit using the unique issued fob, driver must select the appropriate sludge type before discharging the waste (see section 3). The TWUL fleet tanker driver will record the visual waste acceptance check on a Personal Data Assistant (PDA) and / or the WASP data logger. This will require the tanker driver to confirm that a visual assessment of the sludge has been undertaken at the point of origin and that it is deemed to be suitable for acceptance. . The data from each transaction is recorded on the logger and transferred via telemetry system to a central server. The data can then be viewed on a web portal

Waste Acceptance – Raw Cake

If the sludge cake passes the visual checks, undertaken at the site of production it will be loaded and delivered to the destination site where and deposited in the Raw Cake Import Reception building.

Cake volumes are recorded via in vehicle weigh cells, which are then entered on to the drivers PDA which also records the origin of sludge and destination of sludge.

For those works that will receive Raw cake procedures are in place to ensure access to waste reception building is controlled. This is done through the use of a traffic light system and if a site is identified as at 'red' status, the building shutter doors will be closed so as to prevent a tanker entering..

Monitoring and Periodic Sampling (Inter-site sludge and RAW cake)

Thames Water understands that the characteristics of and mixing of such inter-site liquid sludges will influence the anaerobic digestion process at an STC and, therefore, all digestion processes on site are routinely monitored and sampled as listed in Table 5.

This monitoring includes both data recorded using the SCADA system, Local HMI's (Human Machine Interfaces). The effective treatment of waste imports then being verified by separate sampling and monitoring of digested cake (see table 5).

Periodic sampling of inter-site sludge and raw cake will be undertaken in accordance with TWUL sampling procedures to periodically audit the characteristics of inter-site sludge and raw cake against the ranges include in suitable for biological treatment (see Section 6, Table 3).

The frequency of this sampling will be based on the variability of the sludge characteristic identified during the pre-acceptance characterisation stage and the results of periodic sampling compared with these pre-acceptance characteristics and the ranges suitable for biological treatment in Table 3.

Table 5 - Waste Treatment Process Monitoring

Parameter	Unit	Frequency	Method
Digester Feed Volume	(m ³ /day)	Daily	SCADA
Digester feed dry solids	(%Dry Solids)	Very Large sites daily Large sites 5x weekly Medium sites 3x weekly Small sites 2x weekly	Manual Sample
Biogas Production	Nm ³ /day	Daily	SCADA
Volatile matter of digester feed	% VS	Once per week (Min)	Manual Sample
Volatile matter of digestate from each digester	% VS	Once per week (Min)	Manual Sample

Biogas Yield - biogas produced per mass of sludge feed	Nm ³ /tds	Daily	Calculated – Biogas produced/Digester feed Vol x % Dry Solids
Hydraulic retention time	Days retention	Daily	Calculated – Tank Vol /Feed
Temperature of each digester	deg C	Daily	SCADA
Digester outlet dry solids	% Dry Solids	Once per week (Min)	Manual Sample
<p>Digester health is measured at large THP sites 2x per week</p> <ul style="list-style-type: none"> - Or at other sites where digester health is in question – usually noticed by Biogas Yield dropping below expected range for that sludge and type of digestion. - Lab analysed – centrifuge/filtration/titration - Analysis within 3 hours of sample being taken. - Targets are site specific depending on Ammonia range. - Feed rate is reduced and controlled until digester health returns. 			
Volatile Fatty Acids (VFA)	mg/litre	As required, usually daily until digester health returns	Manual sample
Alkalinity	mg/litre		
Ammonia	mg/litre		
pH	pH units		

Waste Acceptance Inter-site - digested cake

Movement of inter-site digested sludge cake occurs as part of routine management of stock levels of BAS compliant stock across Thames Water Sludge Treatment Centres. Treated sludge cake is moved between sites in accordance with the Duty of Care (see section 3). Annual Waste Transfer Notes are supported by records of Individual transactions.

Dry Solids data is used to inform the safe and compliant movement of all sludge cake between sites.

As detailed above for inter-site sludge, the waste acceptance checks for sludge cake will be the responsibility of the driver collecting the load who will visually check digested cake prior to loading for any signs of contamination/abnormal colour or odour to determine if suitable collection and acceptance at the receiving works.

In addition to Dry Solids, inter-site digested sludge cake is routinely checked for the following parameters, at the place of production. This is to confirm that has met characteristics required by Thames Water and is suitable for acceptance for storage at a Sludge Treatment Centre.

Table 6 Thames Water Sludge Analysis Trigger / Alarm Levels

Parameter	Maximum Permissible Level (mg/kg/DS)	Frequency
Zn	1800	Every 4-6 weeks
Cu	1500	Every 4-6 weeks
Ni	500	Every 4-6 weeks
Cd	30	Every 4-6 weeks
Pb	1200	Every 4-6 weeks
Cr	1800	Every 4-6 weeks
Hg	20	Every 4-6 weeks
Mo	40	Every 4-6 weeks
As	140	Every 4-6 weeks
Se	30	Every 4-6 weeks
F	1000	Every 4-6 weeks
DS%	17 – 40%	Every 4-6 weeks
LOI	50 - 90%	Every 4-6 weeks
Total N	1 - 10%	Every 4-6 weeks
Ammoniacal N	0.05 - 5%	Every 4-6 weeks
Total P	1 - 8 %	Every 4-6 weeks

Waste Tracking System

Once accepted it is not possible to track individual loads of sludge or separate them from the indigenous UWWTD sludge. However, it can be estimated that following acceptance sludge will progress through the treatment process according to the average residence times of each process unit. Each site has a tank inventory which details the average retention time of waste in that tank, using this information and the process flow, it would be possible to track a waste load through the system following the date of delivery.

An example of the tank inventory is shown below (Table 7) for the Hogsmill Sludge Treatment Centre (STC). Hogsmill STC operates on a semi continuous process treating combined indigenous and imported sludge.

Each site should refer to their specific tank inventory and retention times for waste tracking purposes and to estimate the length of time a waste has been on site. Combined with records of waste imports and exports (see below), operational SCADA data, validated by visual inspection the quantity of waste present on site may be assessed against the limits authorised by the permit.

Table 7 Example Hogsmill STC Tank Inventory

Tank Purpose	Number	Operational Volume (m³)	Construction	Average Retention Time
Picket Fence Thickeners	3	1668	Glass Lined Steel	4.2 days
Sludge Blending Tanks	1	125	Glass Lined Steel	0.5 days
	1	197	Glass Lined Steel	
Primary Digester	3	3,698	Concrete, External Steel Cladding	15 – 18 days
	1	3,551	Concrete, External Steel Cladding	
Sequential Primary Digester Tanks	2	2,175	Concrete	6 days
	1	2,222	Concrete	3 days
Emergency Storage Tanks	2	2,175	Concrete	7 days
Digested Sludge Dewatering Buffer Tank	1	29	Steel	0.25 days

Waste Recording System

All records produced during waste pre-acceptance and waste acceptance will be recorded on the internal SharePoint system which will allow easy access to information and reporting.

The waste recording system will link through to the tracking system and other systems/databases to ensure that records are as accurate as possible, these systems will include:

- Sludge database - records untreated and treated cake samples etc.
- WASP loggers - records quantity of waste deliveries
- Details of staff training.

Examples of information recorded and stored on the SharePoint site will be as follows:

- Pre-acceptance information
- Waste acceptance including volume/weight, waste types
- Duty of Care Records
- Waste sampling and analysis results and assessments
- Records of any non-conformance or rejection including quarantine and notification of the waste producer
- Any incidents or complaints and details of any mitigation undertaken and follow up investigations
- Waste removal off site

Note that this list is not exhaustive and additional records will be kept as required. Records will be kept for at least 3 years.

8 Non-conformity



Waste Quarantine / Rejection

Non-conformance will be identified from visual checks at the site of origin prior to loading the vehicle. Should there be any signs of contamination, abnormal odour or colour then **the driver will not collect the waste** and a non-conforming load will be identified and reported.

In this scenario, waste is held at the site for further testing and characterisation, until a suitable alternative authorised facility is identified.

Incidents

If on inspection, either via webcam feed or direct visual inspection an incident has occurred, the site Site Manager and/or Bio Recycling Manager are informed and an investigation is undertaken

The event of an incident shall trigger contingency measures. In the event of an Incident, the system Safeguard will be updated to reflect results of the investigation and if further action is required.

An incident or non-conformity can also include, but is not limited to:

- Breach of recording systems (e.g. Non adherence to data recording procedures and use of the WASP system);
- Significant digestion process impact
- Health issues with the UWWT process at the site of production
- Unsafe behaviour (e.g. Incorrect PPE, not abiding to site rules);
- Damage to equipment; and
- Pollution incident.

9

Assurance



This Standard will be subject to an audit regime to ensure the process conforms to Thames Water's requirements and is effectively implemented and maintained.

Any identified actions arising are to be tracked to conclusion, with the learning points captured and cascaded. The findings of the assurance activities must be discussed inside of the Daily Huddle and site performance meetings.

Assurance findings will be reviewed by Senior Management and featured on performance dashboards monthly for review and learning.

Appendix 1 - Site Specific Information / Exclusions

IMPORTANT This generic site procedure **MUST** be read in conjunction with your site **IED AD Environmental Permit and this Appendix 1.**

Waste import activities listed in this document can only be carried out if listed in the sites permit.

This procedure is applicable to the following types of TWUL imported non-hazardous sludges, sludge cake and liquor as well as sludges from water clarification:

- Raw Sludge (Un-thickened and thickened)
- Raw Cake (dewatered raw sludge)
- Digested Sludge Cake (dewatered digested sludge)
- Sludge Liquors
- Sludges from water clarification (and chlorinated water from TWUL network).

This Appendix highlights those TWUL Inter-site waste activities that have are not permitted at certain sites and therefore activities listed in this document that are not authorised at all sites.

The site permit should always be read as the primary document confirming which EWC codes each site is authorised to accept (see also Table 1 in this document for TWUL descriptors):

Activities Not Authorized at Specific Sites

Site Name	Site Specific Exclusions – any reference in this document to
Aylesbury STW	<ul style="list-style-type: none"> • Raw Sludge Cake Import – not permitted • Sludges from water clarification import – not permitted
Banbury STW	<ul style="list-style-type: none"> • Raw Sludge Cake import – not permitted
Beddington STW	<ul style="list-style-type: none"> • Raw Sludge Cake import – not permitted • Sludges from water clarification import – not permitted
Camberley STW	<ul style="list-style-type: none"> • Raw Sludge Cake import – not permitted • Sludges from water clarification import – not permitted
Crossness STW	<ul style="list-style-type: none"> • Raw Sludge Cake import – not permitted
Hogsmill STW	<ul style="list-style-type: none"> • Raw Sludge Cake import – not permitted • Sludges from water clarification import – not permitted
Maple Lodge STW	<ul style="list-style-type: none"> • Raw Sludge Cake import – not permitted
Oxford STW	<ul style="list-style-type: none"> • No site specific exclusions
Reading STW	<ul style="list-style-type: none"> • Digested Sludge Cake import – not permitted • Raw Sludge Cake import – not permitted • Sludges from water clarification import – not permitted
Slough STW	<ul style="list-style-type: none"> • Raw Sludge Cake import – not permitted.