



Asset Management Asset Standard Odour Management Plan

Reading STW READS1ZZ

Document Reference	AM-OMP Reading STW	
Issue Date/Version	Date: July 2022	Version: 6.2
Data Owner	Asset Standards Manager	
Technical Lead(S)	Odour Performance Manager	
Document Author	[REDACTED]	
Approved By		
Document Location	SharePoint and on site	
Reason for Issue	New Sludge Treatment Centre Permit Application	
Next Review	July 2023	

0 Document Control and Procedures

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0.3 Document Control

0.3.1 Document Change Request

Whilst Standards are mandatory, it is recognised that one process may not cover every eventuality and a document user may identify an improvement that does not compromise the objectives of the procedure; in this instance a change request against the Standard should be raised.

Information exchange is essential in supporting continuous improvement of the Standards, and a common document and data change request process is provided via the "TAPS" application available via the TW Portal. Within TAPS "Service Catalogue" menu option there are links and instructions for raising change requests for a variety of subjects.

Change requests are automatically sent to the Standards Process Team, and will be approved by the team, or escalated to the relevant governance group and/or standards board for approval depending upon the potential impact and complexity of the request.

It is a business requirement to comply with standards. Compliance issues will be escalated to the relevant governance group for further action as appropriate.

For further information/advice, please e-mail: am.standards@thameswater.co.uk

Owner Review Requirements

Document to be reviewed when any changes are made to the site or processes

Local Review Requirements

Site Manager should be informed when handwritten amendments are made to this document

Revision No	Reason for Revision	Prepared by	Approved by	Date
1	Update OMP and Baseline Measures			April 09
2	Update OMP and Baseline measures			July 12
3	Conversion and validation of OMP into new standard format			Sept 14
4	Update Performance Manager changes and review of OMP			Jan 18
5	Review of OMP and OCU			Nov 18

6	Updated alongside AD permit application		June 21
6.1	Review of plan & new Performance Manager of site		June 21
6.2	New Sludge Treatment Centre Permit Application		July 2022

0.4 Sign Off

Technical Lead		Date: July 2022
Area Operations Manager		Date: July 2022
Performance Manager		Date: July 2022

0.5 Glossary of Terms

TERM	DESCRIPTION
AD	Anaerobic Digestion
BNR	Biological Nutrient Removal
CHP	Combined Heat and Power
CSM	Customer and Stakeholder manager
DEFRA	Department for Environment, Food and Rural Affairs
EA	Environment Agency
EMS	Environmental Management System
EPR	Environmental Permitting (England and Wales) Regulations 2016
FFT	Flow to Full Treatment
H4	Environment Agency - How to comply with your permit – H4 Odour Management, March 2011
ICA	Instrumentation Control & Automation
IED	Industrial Emissions Directive
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 effected by odour
SAP	Thames Water's enterprise resource and planning system
SCADA	Supervisory Control And Data Acquisition
SOM	Site Operating Manual
STC	Sludge Treatment Centre
STW	Sewage Treatment Works
TCM	Technically Competent Manager
TM	Team Manager
UWWTD	Urban Waste Water Treatment Directive

1 Introduction

This Odour Management Plan (OMP) forms part of Reading STW Best Operating Practice and is a constituent part of the Environmental Management System (EMS). A key related document is the Site Operating Manual (SOM) – this document can be found as a hard copy in the Reading STW administration building and on Thames Water's database SharePoint, within the EMS pages.

The purpose of this OMP is to define how the potential and actual sources of odour from Reading STW are identified, and how, as far as is reasonably practicable, they are controlled and recorded. It is primarily a management guide; detailed procedures are contained within the SOM referred to above.

Changes to OMP procedures are captured in the SOM as part of the periodic reviews of this document.

The effectiveness of the odour control measures will be reviewed at least annually, or sooner, if any of the following occur:

- If the site in question acquires any other permitted activity with the potential to increase the risk of odour off site.
- When significant changes are made to the site which may affect odour, e.g. capital spend.
- As a result of a change in pattern of odour complaints, increase in public concern and as soon as possible after a significant incident.
- When the site management changes.
- If there is a material change in relevant regulations or guidance.

This OMP is an operational document that has been developed following a review of the potential risk areas for odour release. It details operational and control measures appropriate to the reduction or elimination of the impact of odours from wastewater treatment works. It provides detail to allow operators and maintenance staff to understand the operational procedures for both normal and abnormal conditions.

This OMP was updated in 2022 to incorporate appropriate odour control measures for activities that will be newly regulated under an Environmental Permit issued under the Environmental Permitting (England and Wales) Regulations 2016 (EPR), following the principles transposed through the Industrial Emissions Directive. This follows the reinterpretation of the Industrial Emissions Directive in exclusion of UWWTD activities - meaning that anaerobic digestion (AD) on a Sewage Treatment works now needs an Environmental Permit.

The Odour Management plan has been structured to distinguish between the two regulatory regimes, which are fully described in the Site Information chapter. The wastewater treatment process is covered by the Urban Wastewater Treatment Directive (UWWTD). The Environmental Permit for the Sludge Treatment Centre (STC) covers various process including but not limited to, the AD process, combustion of biogas in the CHP plant and the storage of resulting sludge. This OMP responds to odour risks from both UWWTD and STC permitted processes (referred to as the Sludge Treatment Centre Permit).

This OMP is stored electronically on SharePoint within the EMS page. A hard copy is kept on site within the Site Operating Manual.

1.1 Relevant Guidance

The following guidance has been used to inform the contents of the OMP where it relates to activities regulated under the Sludge Treatment Centre Permit. This guidance does not apply to UWWTD activities.

- Environment Agency - How to comply with your permit – H4 Odour Management', March 2011 (H4)
- Commission Implementing Decision (EU) 2018/1147 of 10 August 2018 establishing best available techniques (BAT) conclusions for waste treatment, under Directive 2010/75/EU of the European Parliament and of the Council (Waste Treatment BAT Conclusions)
- Environment Agency, Appropriate measures for the biological treatment of waste, Consultation draft July 2020.

The EA's H4 Odour Guidance has been used to assist the preparation of this OMP where it relates to activities regulated under EPR. As this guidance does not apply to UWWTD activities, where any wider reference to H4 is made within this document, including use of the guidance's recommended forms, this should not be inferred as H4 being applicable to UWWTD activities

This document also aims to meet the guidelines for Odour Management Plans set down in the DEFRA Code of Practice on Odour Nuisance from Sewage Treatment Works, published April 2006 - now rescinded.

The OMP format used is in line with that adopted for other Thames Water sites.

Copies of the Odour Risk Assessment, Odour Improvement Plan, Customer Communications Plan, and Site drawings are included in Appendices 1-4.

2 Site Information

2.1 Location and Receptors

Site Address:

Reading STW
Island Road
Reading
Berkshire
RG2 0RP
What3Words:///found.clouds.belts
EPR Permit number to be included when issued

Reading STW is a new works on a green field site that was commissioned in May 2004 to replace the former Manor Farm works.

The site is located south of the town of Reading, close to the A33 which links the town with the M4 motorway. To the south of the site, separated by a dual carriageway road, is the Green Park business park which consists of a number of commercial office properties. To the west and south is agricultural land and to the west and north is a local council household waste and recycling centre, closed landfill, and local council waste transfer station. To the north is commercial properties consisting of large warehouse type premises. Immediately to the east of the site is derelict land and then the A33.

The Reading STW catchment area encompasses Reading town and extends to Sonning in the North, South to the M4, Theale to the West and the Earley district of Reading to the East.

Receptors

The nearest receptors are given in Table 2.1 and have been marked on site location map in Figure A, Appendix 4:

Table 2.1 Location of potentially sensitive odour receptors.

Receptor Number	Receptor Address	Receptor type	Approximate distance to the nearest site boundary (m)	Direction from the site.	Receptor Sensitivity
1	A33	Passing traffic	190	East	Low
2	Green Park Buisness Park	Commercial	130	South	Medium
3	Household Waste & Recycling Centre	Industrial	Adjacent	West	Medium
4	Warehouses North of Island Road	Industrial	Adjacent	North	Medium

5	Reading Gate Retail Park	Retail	310	South	High
6	Reading Stadium	Recreational	530	South	High
7	New Housing Development – surrounding Champlain Street/Maine Street	Residential	500	South West	High
8	Green Park Village Primary Academy	School	770	South West	High
9	Reading Green Park Train Station	Train Station (Currently under construction)	1000	South West	Medium
10	Area Surrounding S Oak Way	Commercial / Retail / Recreational	950	South	High
11	Tesco Reading Distribution Centre	Industrial	825	South East	Medium
12	Reading International Business Park	Commercial	1400	South East	Medium
13	M4	Passing Traffic	1100	South	Low
14	Hilton Reading	Hotel	250	East	High
15	Whitley	Residential	300	East	High
16	Kennet Island Wildlife Conservation Area	Open Area	430	North East	Low
17	Circle Reading Hospital	Hospital	380	East	High
18	Whitley Park Primary and Nursery School	School	950	East	High
19	Area surrounding Cradock Road	Retail	920	North East	High
20	Reading Trade Centre and surrounding area	Commercial / Retail	1350	North	High
21	Residential area surrounding Northumberland Avenue	Residential	1300	North East	High
22	Longbarn Lane Recreation Ground	Recreational / Open Area	1200	North East	Medium
23	Reading Girls' School	School	1400	North East	High
24	Geoffret Field Junior and Infant School & Christ The King RC Primary School	Schools	1700	South East	High
25	John Madejski Academy	School	1500	East	High
26	Whitley Wood	Residential	1800	South East	High

27	Area surrounding Sentinel End	Retail / Restaurants / Hotel	1200	South East	High
28	Whitley Wood Recreation Ground	Recreational / Open Area	900	South East	Medium
29	Holiday Inn Reading-South M4, JCT.11	Hotel	1100	South East	High
30	Reading Gateway Church @ St Agnes	Church	1400	East	High
31	John Rabson Recreation Ground & South Reading Leisure Centre	Recreational	1500	East	High
32	Fobney Island Nature Reserve	Open Area	500	North West	Low
33	Coley Water Meadows	Open Area	500	North	Low
34	Blue Pool / Gold Lake	Recreational / Open Area	1400	West	Medium
35	Hi 5 Corporate Events & Hi 5 Watersports	Recreational	1400	South West	High
36	Island Sailing Club Reading	Recreational	2000	South West	High
37	Lagoona Park	Recreational	1300	South West	High
38	Tarmac Reading Concrete Plant	Industrial	2000	South West	Medium
39	Coley Park	Residential	1200	North	High
40	St Mary & All Saints C of E Primary School	School	1300	North	High
41	Berkshire Independent Hospital	Hospital	1450	North	High
42	Residential area surrounding Hatford Road	Residential	1850	North West	High
43	Blessed Hugh Faringdon Catholic School, The Wren School	Schools	2000	North West	High
44	Kennet Island Housing Complex	Residential	400	East	High

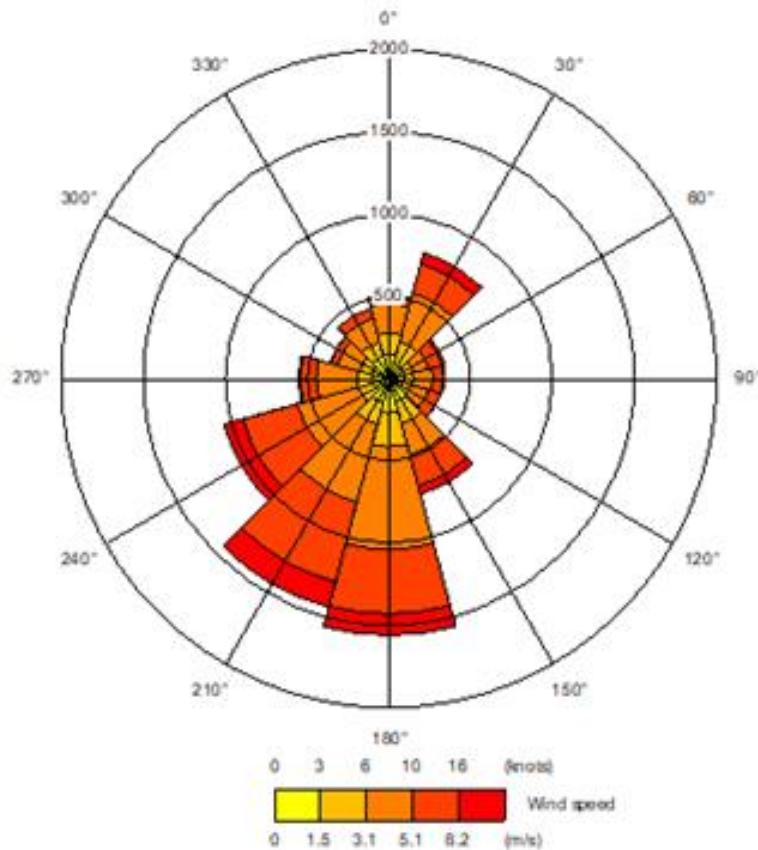
2.2 Off-site sources of odour

There is a large waste recycling facility, immediately adjacent to the western site boundary.

2.3 Wind Rose and Weather Monitoring

A wind rose showing the distribution of wind speed and direction close to the site is provided below and shows the predominant wind direction to be south / south westerly. The data is taken from RAF Benson meteorological station, approximate location E 462581 N 191076. Data is recorded in hourly measurements and the information covers the year 2020.

Figure 2.31: Benson Wind Rose, 2020



There is no on-site weather station at Reading. Weather on site can be reviewed if complaints are received or during periods of abnormal operations. The internal ‘Weather’ SharePoint site provides adverse weather information, and the UK Met Office website can also be used.

2.4 Site Layout and Treatment Processes

For site plans, see appendix 4. Further details of the site layout and treatment processes are given in the following sections of the Site Operating Manual and are therefore only given summary attention in this OMP:

Section	Description
1	Governance & Control

2	Location, key layout plans and diagrams. Site services, including power, water, drainage, SCADA and ICA. Consent details, process overview, chemical and waste handling.
3	Detailed description of each treatment process, including sludge and odour control.
4	Maintenance
5	Plant control, monitoring, and logging.

2.5 Process Description

2.5.1 UWWTD activities

Flow is received at the raised inlet works from 6 no. PSs (Pumping Stations), storm water return and inlet works drainage.

There are four 6mm screens that screen the crude sewage. There are facilities to pass the flow from Bennet Road PS. Screenings are conditioned in a tank and passed to two. Licep units for processing. Degrittied and dewatered screenings are fed to two compactor skips.

There is a cess logger at the site.

A motorised penstock weir linked to a flow to treatment flow meter controls the storm overflow. There are four underground storm tanks that extend beneath the car park beside the inlet works. Tanks no. 1&2 act as buffer tanks and return back to the works and have no overflow to the river. Tanks no 3&4 have overflows to the river. Each tank has two mixer pumps. The storm tanks are automatically emptied and returned to the works for treatment when incoming flows subside following a storm.

There are two FOGG (Fat Oil Grease and Grit) removal tanks on site, but these are out of service.

Flow passes to six Primary Lamella settling tanks for primary treatment. Raw sludge is pumped to the sludge building. The preliminary and primary treatment stages are all inside buildings.

Secondary treatment is by a 6-lane covered BNR (Biological Nutrient Removal) plant and eight FSTs (Final Settlement Tanks).

There are six Travelling hood sand filter units that provide tertiary treatment to the entire flow – these have been de-commissioned.

The final effluent line flows to Foudry Brook with 2 x tertiary treatment, cloth filters for the Biochemical Oxygen Demand consent now in service.

The majority of the plant is covered for odour control, except for the tertiary treatment plant and the FSTs.

2.5.2 Sludge Treatment Centre Permit Activities

The STC comprises an offloading point for permitted imported wastes which can be found in the north-east corner of the site. These wastes are imported by road, normally from tankers and tanker vehicles, and consist of liquids and associated sludges from domestic and municipal sources that are similar in composition to those materials derived from the sewer network via the UWWTD route. This imported waste material is discharged to an adjacent wet well where it mixes with incoming flows

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from the sewer network and site drainage. At this point it falls outside of the permitted activities on site. The UWWTD treatment process is then followed.

Imported raw sludge from other waste water treatment sites are imported via an offloading point, consisting of two transfer hoses and data logger outside of the sludge building. This imported sludge passes into the sludge building where it is deragged to remove inorganic material, which is discharged into an external skip. The liquid fraction drops into one of the two raw sludge tanks which are located in the basement level of the sludge building, where imported sludge is mixed with indigenous sludge.

Raw sludge from the lamella separators is pumped by sludge feed pumps from the inlet building, through sludge screens, to the two raw sludge tanks located in the basement level of the sludge building, where imported sludge is mixed with indigenous sludge. The whole of sludge building is odour abated and connected to an Odour Control Unit (OCU), which uses chemicals to treat malodorous air before emitting it via a discrete stack. Both raw sludge tanks are of concrete construction, enclosed and odour abated with a volume of 1,200 m³ each. They are subject to air mixing and fitted with high level alarms which prevent overflowing of the tanks by inhibiting the sludge feed pumps.

The mixed indigenous and imported sludge is removed from the base of each tank and pumped via two feed pumps to two separate belt presses which dewater the raw sludge. The belt presses operate to dewater the raw sludge with the addition of a powder polymer (from a bulk bag system) to aid coagulation. Liquor from this thickening process gravitates to the raw liquor balancing tank before being pumped back to the works inlet. Sludge from this process is pumped to the sludge blending tanks where it is mixed within thickened Surplus Activated Sludge (SAS).

SAS is pumped directly to the SAS belts from the Returned Activated Sludge (RAS) chamber of the Final Settlement Tanks (FSTs) via a subsurface pipe. There are two belt presses used to thicken the SAS with addition of a liquid polymer (from an IBC) to aid coagulation. Liquor from this thickening process gravitates to the raw liquor balancing tank before being pumped back to the works inlet for further treatment. Sludge from this process is pumped to the sludge blending tanks where it is mixed within thickened raw sludge.

There are two sludge blending tanks which are located within the sludge building and are both of concrete construction, enclosed and with a volume of 500 m³ each. Sludge is pumped in at a high level and removed at a lower level. The two sludge blending tanks can operate together or in sequence, as required, and deliver the mixed thickened sludge to the pasteurisation process.

The pasteurisation process has two streams consisting of one larger pasteurisation reactor tank and one smaller pasteurisation tank each. The pasteurisation process operates 24/7, receiving small batches of sludge at a time and the pasteurisation process takes a minimum of approximately 96 minutes. The process requires a heat input to achieve the required pathogen kill and this heating is supplied in the form of recovered heat from the sites CHP engines or auxiliary boilers.

Dedicated digester feed pumps transfer the pasteurised sludge to one of the four primary digester tanks at Reading STC. The primary digester tanks are concrete tanks clad with an insulating outer layer. The tanks are fully enclosed with fixed roofs and extend slightly subsurface. Each tank has an operational capacity of approximately 1,775 m³, giving a total digester volume of 7,100 m³. The primary digesters operate on a continuous basis. Fresh pasteurised sludge is introduced at ground level with mixing via sludge recirculation pumps, and the digestate fills and spills by gravity to the digested sludge buffer tanks. Each digester tank is mechanically mixed, fitted with dual pressure relief and vacuum relief valves, high level alarms, low level alarms and interlocks that would inhibit the digester feed pump; this is all linked to a SCADA system. Anti-foam is dosed from an IBC as

required. Under normal circumstances there is no external heat input to the primary digesters as the incoming pasteurised sludge is of sufficient temperature, but external heating can be provided as required via heat exchange system.

There are two enclosed digested sludge buffer tanks in the dewatering building, each with a volume of 450 m³. The tanks feed two dewatering centrifuges located within the dewatering building and are fitted with high-level and low-level alarms. Pumps transfer the digested sludge to the centrifuges which use a polymer to aid coagulation. The centrifuges take diluted polymer from a stock tank which can be made up from either liquid IBCs or powder from a bulk bag system. Centrate liquor from this thickening process gravitates to a wet well before it is pumped back to a point near the lamella separators for further treatment. Dewatered digested sludge from this process is pumped to one of the three cake silos.

Digested sludge cake is stored within one of the cake silos, each of which can hold approximately 15 days' capacity. Digested sludge cake is deposited directly into lorries that drive through a loading area that is directly underneath the three silos. The loading area is engineered concrete with drainage that connects to the site drainage system. Discharge of the digested cake into the lorries is controlled by the driver, who exits the loading area when full. Digested sludge cake is subject to removal from site under the Sludge Use in Agriculture Regulations 1989 (SUiAR), and in accordance with the Biosolids Assurance Scheme (BAS). In the event of mechanical failure or in contingency, a temporary cake pad is formed using concrete barriers outside of the dewatering building. Digested sludge cake is deposited onto concrete hardstanding, which is connected to drainage, and transferred to lorries using a shovel loader (or similar).

Biogas from the primary digester tanks is captured and transferred via a common biogas line that is predominantly aboveground, to one of two double membrane gas holders for storage. Biogas is also captured from the digested sludge buffer tanks, joining the common biogas line and transferred to the gas holders. The biogas transfer pipeline is equipped with condensate pots that capture entrained moisture from the generated biogas and allow it to be drained into the site drainage system for treatment. The biogas storage holder and primary digester tanks are fitted with pressure release valves as a safety precaution in the event of over pressurising the system.

The biogas is taken from the storage vessel for combustion in CHP engines, generating electricity for use both within the site and for export to the grid, and heat to the pasteurisation process. This is classified as an 'existing' combustion plant under the Medium Combustion Plant Directive. In the event that additional heating is required for pasteurising sludge, biogas or diesel may be used in the onsite dual-fuelled boilers to provide heat to the digesters. In the event there is excess biogas, i.e. more than the CHP or boilers can utilise, or in the event that the CHP is unavailable, there is one ground mounted emergency flare. The flare is utilised under 10% of the year or less than 876 hours per year. The CHP engines and boilers are currently operated under an Environmental Permit which will be merged with this permit.

The site has one double walled above ground diesel storage tank, adjacent to the powerhouse, that provides fuel to the two back-up generators and backup fuel for the boilers. The site has two standby generators that are used for regular testing and emergency only.

Site drainage from operational areas is captured within the site wide drainage system and returned to sewage treatment works for treatment within the UWWTD treatment route.

3 Site Management Responsibilities and Procedures

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3.1 Site Roles

Figure 3.1 - Site Roles

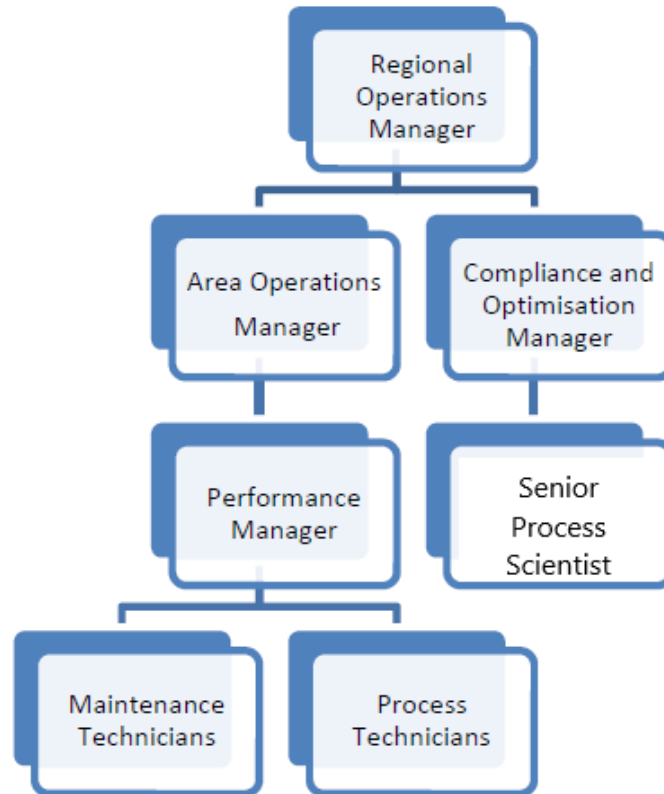


Table 3.1 - Tasks and Responsibilities

Role	Tasks and Responsibilities
Area Operations Manager	Responsible for the overall performance of the STW and catchments areas.
Regional Operations Manager	Responsible for the overall performance of STW in this region.
Performance Manager	Responsible for overall performance of the STW and will be responsible for <ul style="list-style-type: none"> • odour control and management at the site • day to day implementation of the OMP • dealing with customer complaints • assessing the scope of, and updating, the OMP as it is implemented. • Responsible for day-to-day operation of the STW • Ensuring staff Thames Water staff undergo appropriate training

Role	Tasks and Responsibilities
Technically Competent Manager	Hold the required WAMITAB qualification to support the activities on site under EPR, ensuring permit conditions are complied with.
Tech 1s	Day to day duties include maintaining and operating process equipment.
Customer and stakeholder manager	Responsible for managing liaison with all external customers and Stakeholders in liaison with customer centre, escalation team, local govt. liaison team etc.
Compliance and optimisation manager	Responsible for process investigations and technical assistance.
Process and Compliance Coordinator	Reports to Process Optimisation Manager. Responsible for process monitoring, improvement and troubleshooting.
Duty Manager	The duty manager is centrally based (off-site) and is responsible for event management across the business.
Customer Centre	Responsible for receiving all customer calls, logging them and passing them to the appropriate operational departments.

The site is manned during normal working hours.

3.2 Key Contacts

Role	Name	Email address	Phone Number
Area Operations Manager			
Performance Manager			
Technically Competent Manager			
Customer and Stakeholder Manager			
Customer Centre			

3.3 Operator Training

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Staff working on site undergo a site induction that is carried out by the Performance Manager. The site induction includes direction to the presence and location of the various operational procedures which include the SOM and the OMP. In addition, Site Tech 1's undergo a specific programme of training which covers management of activities on site.

All training records are currently held on Learning on Tap where they are accessible by the site Performance Manager and individual members of staff.

4 Odour Critical Plant Operation, Monitoring and Management Procedures

4.1 Odour Sources, Critical Issues and History

Complaints are recorded centrally by Thames Water. Reading STW received 5 odour complaints in 2020, 4 in 2021 and 12 in 2022 (YTD).

An Odour Risk Assessment is included as Appendix 1.

An Odour Improvement Plan is included (where applicable) as Appendix 2.

Critical Odour Issues, Emergency Response and Mitigation Measures are summarised in Tables 4.2 to 4.6.

4.2 Identification of Odour Critical Plant

4.2.1 Odour Risk Assessment

The Odour Risk Assessment has been carried out and a copy is included in Appendix 1.

Odour Risk Assessment is not a 'one-off' exercise but an on-going process. It is constructed in the following manner:

- Each part of the treatment process is considered under different operating modes – e.g. normal, failure, abnormal: system overload, summer conditions, maintenance etc.
- The nearest customers to the particular odour source are identified.
- The likely frequency and duration of occurrence for each eventuality is identified.
- A score is assigned to the severity (0 – 5) of odour under each operating mode.
- A score is assigned to the probability (0 – 5) of causing an odour nuisance for each operating mode.
- Multiplying the severity of odour and probability of causing an odour nuisance generates a 'Current Odour Emission Risk' score. Between 0 (zero risk) and 25 (maximum risk), this is used to decide where mitigation should be applied in the short term, and determine where in the longer term enhanced improvement measures are required. Where improvements are identified as necessary (i.e., where suitable mitigation measures are not already in place), entries are made onto the Odour Improvement Plan.
- The need for operational mitigation, enhanced measures and customer communication is stated and brief details given.

Items scored in the Odour Risk Assessment with a risk score greater than 10, and where existing operational mitigation measures are not sufficiently robust, will have Improvement Plans generated to address the odour issues. The Odour Improvement Plan for Reading STW is included in Appendix 2.

4.2.2 Potential Odour Sources

The following list of potential UWWTD odour sources been identified during the risk assessment:

- Island Road PS
- Cess Reception

- Storm tanks and storm SPS
- Inlet Channel
- Inlet Screens
- Screened Sewage Outlet Channel
- Drainage Sump
- Lamella Building
- Inlet Odour Control Unit
- BNR Lanes
- BNR Lanes air extraction system
- Final Settlement Tanks
- Final outfall

The following list of potential Sludge Treatment Centre permit odour sources been identified during the risk assessment:

- Cess Reception
- Sludge reception, screening, washdown and drainage
- Raw/SAS Thickening Streams
- Sludge Blending and Mixing
- Heat Exchangers, Pasteurisation Units, Hot Sludge Pumps
- Digesters
- Centrifuge
- Digested Sludge Buffer Tanks
- Sludge Cake Silos
- Vehicle Movements & Wash Down
- Sludge Building OCU
- Gas Bags and Gas System
- CHP
- Boilers
- Waste Gas Burner
- Gas Boosters

4.2.3 Odour Critical Plant

The following list of odour critical plant has been identified during the risk assessment:

- Inlet Odour Control Unit
- Sludge Building Odour Control Unit

4.2.4 Waste Storage for Sludge Treatment Centre Permit

Waste is not stored on site prior to treatment through the UWWTD or AD process. A list of the main tanks relating to the sludge treatment process and their associated volumes and retention times is shown below.

Table 4.0 Sludge Treatment Centre Permit Tank Inventory

Tank Purpose	Number	Operational Volume (m ³)	Construction	Average Retention Time (where available)

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Raw Sludge Tanks	2	1,200 (each)	Concrete	2 – 8 days
Sludge Blending Tanks	2	500 (each)	Concrete	2.3 days
Pasteurisation – smaller	2	30	Steel	96 mins – 8 hours
Pasteurisation – larger reactor	2	100	Steel	
Primary Digester Tanks	4	1,775 (each). Total digester volume: 7,100.	Concrete, clad with an insulating outer layer. Fixed roofs.	18 days
Digested Sludge Buffer Tanks	2	450 (each)	Concrete	2 days
Raw Liquor Balancing Tank	1	Not recorded	Concrete	Not recorded

An inventory of potential odorous materials relating to the Sludge Treatment Centre Permit is shown in Table 4.1 below. Air Emission Points are listed, and the locations shown on the site plan in Figure C of Appendix 4.

Table 4.1 Odorous materials for Sludge Treatment Centre Permit

Odorous and potentially odorous material (any solid, liquid or gas)	EWC Codes	Odour potential High Risk / Medium Risk / Low Risk	Maximum quantity on site at any given day	Maximum time held on site (hours or days)	Location of odorous materials on site
Cake	19 06 06	Low	700 tonnes	30 days	Cake Silos / Temporary Cake Pad
Biogas	N/A	Low	Gas holder capacity is 210m ³ (each). Total 420m ³ .	Continuous operation	Point A9 and A10 on Air Emission Point Plan
Liquor	16 10 02	Low	Liquor is continuously pumped to the head of works	Continuous pumping of liquors.	Site drainage, wet well and raw liquor balancing tank
Raw imported sludge	19 08 05	Medium/High	Refer to Table 4.0 Site Tank Inventory	Retention times for each stage of the process are detailed in Table 4.0	Works inlet and/or Sludge Building

Odorous and potentially odorous material (any solid, liquid or gas)	EWC Codes	Odour potential High Risk / Medium Risk / Low Risk	Maximum quantity on site at any given day	Maximum time held on site (hours or days)	Location of odorous materials on site
Primary Sludge	19 08 05	Medium/High	Refer to Table 4.0 Site Tank Inventory	Retention times for each stage of the process are detailed in Table 4.0	Sludge Building
Thickened sludge import	19 02 06	Medium/High	Refer to Table 4.0 Site Tank Inventory	Retention times for each stage of the process are detailed in Table 4.0	Sludge Building
Surplus Activated Sludge	19 08 05	Medium/High	Refer to Table 4.0 Site Tank Inventory	Retention times for each stage of the process are detailed in Table 4.0	Sludge Building
Raw Sludge screenings	19 08 01	Low / Medium	1	Skips emptied within 24 hours of being full	Outside the Sludge Building

4.3 Odour Control Measures

The SOM referred to above complies with Thames Water's Asset Standards – Operating Standards. It states the operational procedures to be followed in order to maintain and operate plant to agreed company standards. These standards include, where appropriate, procedures for ensuring that generation of odour is kept to a minimum. Refer to risk assessment in Appendix 1 where these measures are summarised.

4.3.1 Odour Control Units

Reading works has been designed to minimise odour emission from the site. This has been achieved by erecting process equipment in ventilated buildings, and covering individual plant items i.e. tanks with ventilated enclosures. The building-wide extraction ducting system is connected to the various equipment covers. The odorous air is drawn through ducting to 2no. wet scrubbing plants and discharged to 3no. vertical stacks. The stack of the inlet OCU is currently subject to an OIP.

Odour Scrubber Plant.

The odour control plants are designed to remove Hydrogen Sulphide, a principle contributor to odorous air. Each plant is controlled by a dedicated local PLC and is monitored from SCADA. The odour control plant is comprised of an extracting ducting system that is connected to the suction (inlet) side of a gas-scrubbing tower. 2no. centrifugal fans that operate duty/standby provide suction. The fans discharge via a manifold to a stack. The tower contains packing and the odour is removed by bringing the air into contact with a chemical solution of sodium hydroxide and sodium hypochlorite. The chemical solution is introduced to the top of each tower by spray bars and the air is drawn in from the base.

The sodium hydroxide and sodium hypochlorite for each plant are stored in dedicated bulk tanks. The chemicals are drawn from the tanks via dual dosing pumps and discharged via injectors into the scrubber solution recirculation line downstream of the recirculation pumps. Analysers monitor the recirculating scrubber solution and the local PLC regulates the rate of chemical dosing. The solution is passed through a proprietary nickel-based catalyst downstream of the recirculating pumps, which speeds up the reaction process. Softened water is used to make up the scrubbing solution and a package unit connected to the potable water supply produces this. Make-up water is introduced at a pre-set manual rate, which creates a continuous overflow. The softened water flow rate is set to maintain a set hardness in the recirculating solution.

Standby Carbon Filter.

Each odour scrubbing tower has a standby GAC (Granulated Activated Carbon) filter that absorbs the sulphide compounds from the gas stream. The carbon media is regenerated by soaking or washing the filter in acidified (pH2) potable water completed by contractors. Carbon requires regenerating after 4 months of continuous use or when Hydrogen Sulphide is detected in the gas stack.

There are two odour control units on site; one that treats the effluent stream and is located in the Inlet works building, and another that treats the sludge stream and is located in the basement of the Sludge building.

The Inlet works odour control unit treats the inlet building and the lamella building.

The Sludge building odour control unit treats the sludge building which contains:

- Import sludge screens
- SAS Dewatering Aquabelts
- Raw Sludge Tanks
- Raw Sludge Belts
- Sludge Blending Tanks
- Pasteurisation Plant

4.3.2 BNR Odour Control - air extraction system

The aerated BNR lanes are mostly covered and exhausted via ducting to dual (duty/ assist) extraction fans. The fans discharge to a stack next to the digesters. A flow switch in the common outlet duct signals flow to the stack.

4.3.3 Site Specific Measures and Abnormal Events

H4 has been used to guide the preparation of this OMP where it relates to activities regulated under the Sludge Treatment Centre Permit. As this guidance does not apply to UWWTD activities, where reference to H4 is made within this document this should not be inferred as H4 being applicable to UWWTD activities. Specific tasks and measures taken in intermittent, abnormal, and emergency events associated with the control of odours at Reading STW are summarised in the tables below.

The routine operational tasks carried out at Reading STW to specifically mitigate against generation of odour are also listed in the tables below.

Tables 4.2-4.6 - Summary of Critical Odour Issues, Emergency Response and Mitigation Measures

The purpose of Table 4.2-4.6 shall be to identify site specific emergency response procedures and mitigation measures relating to site odour generation and release. They include:

- Generic odour issues and mitigation measures relating to site-specific process stages; and,
- Additional site-specific odour issues and mitigation measures associated with process stages identified under the site Odour Risk Assessment.

Daily and weekly Site Round and Sludge Round checks are also carried out on each part of the process to ensure correct operation, these are shown in Appendix 5 and 6.

Table 4.2: Summary of routine odour mitigation tasks for assets under UWWTD

Odour source	Odour and offensiveness L/M/H	Specific odour management tasks	Responsibility	Monitoring	Monitoring Frequency
Island Road PS	Sewage/Fat / L	General Housekeeping, keep covers locked down	Site Tech 1s	Visual Inspection	Daily
Cess Reception	Septic sewage / L	Enclosed and sealed, with wash down facilities	Site Tech 1s	Visual Inspection	Daily
Storm tanks and storm SPS	Sewage / L	Underground and covered tanks. Connected to inlet OCU	N/A	Continuous	Continuous
		Ensure mixers are used to keep solids in suspension	Site Tech 1s	Visual Inspection	Daily
Inlet Channel	Sewage / M	Inside Building, Odour controlled	N/A	Continuous	Continuous
		Covers to be kept closed	Site Tech 1s	Visual Inspection	Daily
Inlet Screens	Musty / M	Inside Building, odour controlled.	N/A	Continuous	Continuous
		General housekeeping.	Site Tech 1s	Visual Inspection	Daily
Screened Sewage Outlet Channel	Sewage / L	Enclosed in pipe. Odour controlled.	N/A	Continuous	Continuous
		General housekeeping.	Site Tech 1s	Visual Inspection	Daily
Drainage Sump	Musty / L	Covered and underground	N/A	Continuous	Continuous
		Wet well cleaning by tanker every couple of months	Site Tech 1s	Visual Inspection	Bimonthly
FOG Lanes	None	Not currently in operation. Completely covered and sealed, skip within the building.	N/A	Continuous	Continuous
Grit Classifiers and Skips	None	Not currently in operation. Enclosed in inlet building	N/A	Continuous	Continuous
Lamella Building	Sewage / L	Process units inside Building. Odour controlled.	N/A	Continuous	Continuous
		Ensure all doors are closed to odour-controlled buildings	Site Tech 1s	Visual Inspection	Daily
Inlet Odour	Sewage / L	Complete Checks as part of site rounds in appendix 5.	PM / Site Tech 1s	SAP / SCADA / Visual	Daily

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Control Unit				Inspection	
		Monthly performance checks by specialist Framework agreed contractors.	Contractors	As described	Monthly
BNR Lanes	Earthy / L	Covered. Keep hatches closed and general housekeeping	Site Tech 1s	Visual Inspection	Daily
BNR Lanes air extraction system	Earthy / L	Keep fans running	Site Tech 1s	Visual Inspection	Daily
Final Settlement Tanks	River / L	Mallard pumps	N/A	Continuous	Continuous

Table 4.3: Summary of routine odour mitigation tasks for assets under Sludge Treatment Centre Permit

Odour source	Odour and offensiveness L/M/H	Specific odour management tasks	Responsibility	Monitoring	Monitoring Frequency
Cess Reception	Septic sewage / L	Enclosed and sealed, with wash down facilities	Site Tech 1s	Visual Inspection	Daily
Sludge reception, screening, washdown and drainage	Sludge / M	Sludge import screen odour controlled via Sludge building OCU. Screen is inside and covered.	N/A	Continuous	Continuous
		Change skip regularly	Site Tech 1s	Visual Inspection	Daily
Raw/SAS sludge thickening streams	Sludge / H	Inside Building, under hoods, Odour controlled via Sludge building OCU	N/A	Continuous	Continuous
		General housekeeping	Site Tech 1s	Visual Inspection	Daily
Sludge blending and mixing	Sludge / L	Covered tank, odour controlled.	N/A	Continuous	Continuous
		General housekeeping	Site Tech 1s	Visual Inspection	Daily
Heat Exchangers, Pasteurisation Units, Hot Sludge Pumps	Strong Sludge / M	Inside Building, Odour controlled via Sludge building OCU	N/A	Continuous	Continuous
		General housekeeping	Site Tech 1s	Visual Inspection	Daily

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Digesters	Sludge / L	Check gas seals and whessoes.	Site Tech 1s	Visual Inspection	Daily
		All sealed during normal operation	N/A	Continuous	Continuous
Centrifuge	Digested sludge / L	Enclosed within building.	Site Tech 1s	Visual Inspection	Daily
Digested Sludge Buffer Tanks	Digested sludge / L	Inside building, covered tanks	Site Tech 1s	Visual Inspection	Daily
Sludge Cake Silos	Digested sludge / L	General housekeeping	Site Tech 1s	Visual Inspection	Daily
		Completely enclosed during storage	N/A	Continuous	Continuous
Vehicle Movements & Wash Down	Digested sludge / L	Wheelwash and lorries are covered before leaving site	Biorecycling	Visual Inspection	As required
Sludge Building OCU	Slight sludge / L	Subject to checks as per site rounds in appendix 5.	PM / Site Tech 1s	SAP / SCADA / Visual Inspection	Daily
		Monthly performance checks by specialist Framework agreed contractors.	Contractors	As described	Monthly
Gas Bags & Gas System	Biogas / L	Gas bags are fully contained, double-skinned and PRVs are monitored and alarmed. The gas system utilised is subject to regular preventative maintenance.	CHP Team	As described	Daily / Weekly
CHP	Biogas / L	Engines within building, stack outside	N/A	Continuous	Continuous
		Regular maintenance and monitoring	CHP team	SCADA	Weekly
Boilers	Biogas / L	Inside building, enclosed.	N/A	N/A	Continuous
Waste Gas Burner	Biogas / L	Serviced every 12 months as part of asset standards.	Performance Manager	As described	Yearly
Gas Boosters	Biogas / L	Fully contained, leak detection undertaken.	N/A	N/A	Continuous

Table 4.4: Intermittent (Int), abnormal (Ab), and emergency (E) events for assets under UWWTD

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Process stage	Event	Status	Ops mitigation	Odour risk after mitigation
Island Road PS	Septic sewage from low flows or sewer cleaning	R	General Housekeeping, keep covers locked down	L
Cess Reception	Spills	R	Clean ASAP, see section 4.3.4.	L
Storm Tanks and Storm SPS	Septic Sewage	R	Use of mixers, ensure returned when possible.	L
Inlet Channel	Blockage	R	Clear ASAP	L
Inlet Screens	Blockage	R	Clear blockage, hose down and return to service.	L
	One unit out for maintenance	P	Screen out and washed down prior to maintenance. Ensure clean and return to service ASAP.	L
Screened Sewage Outlet Channel	Blockage	R	Clear ASAP and return to service.	L
Drainage Sump	Pump failure	R	Tankering or over pumping while pump is repaired	L
	Cleaning	P	Tankering and in OCU abated building	L
Lamella Building	Skim top of lamellas	P	Complete ASAP, keep doors closed if possible.	L
Inlet Odour Control Unit	Chemical Runs Out	R	Reorder chemical, standby carbon filter. Chemical levels are checked daily and run charts produced.	M
	Odour Unit Failure	R	Unlikely to be complete failure as there is a carbon filter and a standby fan. Turn on temporary carbon filters. Contractor to refurbish OCU.	H
BNR Lanes	Lane out of service	P	Clean as far as possible	L
BNR Lanes air extraction system	Fan failure	R	Repair ASAP and return to service, there are two fans.	L
Final Settlement Tanks	Tank drained down for maintenance	P	Hose down ASAP	L

Table 4.5: Intermittent (Int), abnormal (Ab), and emergency (E) events for assets under Sludge Treatment Centre Permit

Process stage	Event	Status	Ops mitigation	Odour risk after
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				mitigation
Cess Reception	Spills	R	Clean ASAP, see section 4.3.4.	L
Sludge reception, screening, washdown and drainage	Spills	R	Clean ASAP as per spills procedure, see section 4.3.4	L
Raw/SAS sludge thickening streams	Spills	R	Clean ASAP as per spills procedure, see section 4.3.4	L
	Failure / maintenance of 2 or more units	R / P	It is normal to have one unit out of service. Inside Building, Odour controlled. Covers off for maintenance. Ensure washdown is completed. Thorough clean of unit.	L
Sludge Blending & Mixing	Spills	R	Tanker cleaned up ASAP. Inform EHO.	M
Heat Exchangers, Pasteurisation Units, Hot Sludge Pumps	Maintenance	P	Keep all doors shut, in odour controlled building, completed on days which when temperature is lower.	L
	Failure of 1 or more units	R	Repair ASAP and return to service. Might need reactor drain and clean. Still contained within building and dealt with by OCU.	L
Digesters	Gas release through Whessoe Valves	R	Checks on seals and whessoe valves. Emission of small amounts gas at high level. Valves repaired if leaking.	L
	Sludge spillage	R	Clean ASAP as per spills procedure, see section 4.3.4	M
Centrifuge	Spills	R	Clean ASAP as per spills procedure, see section 4.3.4	L
	Maintenance	P	Only one centrifuge runs normally so can take one out for maintenance without an impact on odour. Washed out first.	L
Sludge Cake Silos	Spills	R	Driver / Tech 1s to clear up any spills ASAP as per spills procedure, see section 4.3.4	L
Sludge Building OCU	Chemical Runs Out	R	Reorder chemical, Standby carbon filter turned on. Chemical levels are checked daily and run charts produced.	M
	Odour Unit Failure	R	Stop imports. There is a Standby carbon filter and there are duty/standby fans. Turn on temporary carbon filters. Contractor to	H

			refurbish OCU.	
Gas Bags & Gas System	Loss of containment	R	Biogas is principally stored within two double membrane gas holders which are suitably sized to manage biogas generation. The gas system utilised is subject to regular preventative maintenance to minimise the potential for leaks occurring. The system is also protected with a comprehensive array of pressure and flow sensors and with isolation valves to minimise the potential for release if a leak is detected. Personnel on site wear portable gas detectors in order to alert staff to presence of biogas.	L
	Failure of CHP engines	R	Flare off excess gas. CHP engines and boilers are subject to regular maintenance to maintain maximum use of outlets, with flare maintained in good working order should it need to be used.	L

Table 4.6: General Intermittent (Int), abnormal (Ab), and emergency (E) events

Incidents and emergencies	Event	Status	Ops mitigation	Odour risk after mitigation
Flooding	Flooding causing process or equipment problems	E	Considered to be unlikely as flooding is not a known problem for the area. There is a flood plan in place as part of the emergency response plan, which can be found on SharePoint.	Low
Illness/absence of key staff	Accumulation of sludge/loss of odour control etc.	E	Task allocation is independent of individual staff.	Low
Power cuts	Loss of power to fan leading to loss of odour control	E	Within Thames Water's incident response planning, arrangements are already in place with a supplier for temporary generators. This agreement has a Service Level Agreement for provision within 24 hours.	Low
Fire	Failure of fans or sludge building	E	Use of SHTs for storage of sludge. Tanker from site	Low/Medium
Severe weather	Transport of sludge cake from site inhibited resulting in back up of sludge in site.	E	Set up of temporary cake pad	High

4.3.4 Spillages

Spillages significant enough to cause odorous emissions will be cleared as soon as practicable. The person discovering the spillage will inform site management, who will utilise resources as required to clear it.

Spill response guidance is also available in the Pollution Prevention Essential Standard at [Environmental Management System - Pollution Prevention \(sharepoint.com\)](#).

4.4 Routine Monitoring

Overall plant performance is assessed daily as part of the generic Site and Sludge inspections rounds, which apply to Thames Water large STW sites, and have been included in appendices 5 and 6, respectively.

The objective of these are to ensure that treatment processes, including odour control, are checked for effective operation as per the SOM. Any of the checks that result in performance of the process outside of the limits defined in the SOM or a fault being detected will require an Operator to change the process to bring the plant back into acceptable limits or the fault needs to be logged and reported for follow up maintenance/repair. A daily check of site odour is also recorded in the E-Logbook.

Various process parameters are monitored using a combination of online instruments (to measure flows, temperatures, pressures, levels); samples that are taken to our UKCAS accredited laboratories, or run through sampling tests at the on-site laboratories (%DS, pH, alkalinity, ammonia).

The online instruments all have signals that are taken back to the site SCADA system and these 'alarm' if the readings are outside pre-set trigger points. Similarly, laboratory analysis samples will have expected ranges, which if outside of these, a notification is sent to the site process controllers.

In all instances that parameters are out of 'range', the operational teams will carry out an investigation to understand the cause and initiate corrective actions. If the reasons are not obvious, the process optimisation team is contacted to evaluate further.

Additionally, each week the various recorded parameters are recorded in the site Cockpit reports to look at trends. These are used to establish if there are gradual changes in performance over time so that early intervention can be carried out.

A range of process parameters are subject to routine monitoring or checking to ensure that the digestion process is operating optimally so that the required sewage cake output quality is achieved.

- pH: At a pasteurisation digestion site such as Reading the processes is maintained around pH 8 but within the range 7.5-8.6 (this is % dry solids and digester load dependant) for healthy operation.
- alkalinity: Levels dependant on feedstock characteristics (primary sludge: surplus activated sludge (SAS) ratio). Advanced digestion (pasteurisation) typically, 5,000 - 10,000mg/litre (target range from 6,000-8,000 mg/litre) but is dependent on % dry solids and digester load.
- temperature: minimum target of 40°C for advanced digestion. This is maintained within the range 36-45°C.

- HRT (hydraulic retention time): minimum target is 15-days, there is no upper limit. Retention times shall not be less than 12-days during plant outages to keep the product pathogen kill efficiency control.
- OLR (organic loading rate): see table below - this is dependent on the primary/SAS ratio. Reading fits into the second row of the table.
- Dry solids feed: see table below, Reading has a target of 10%DS, but this can vary between 8-14%DS and impacts the HRT.

Type of Digestion	0%- 35% SAS*	36%- 45% SAS	46%- 50% SAS	51%- 55% SAS	>55% SAS	Max Feed %DS
MAD* in Conventional Digestion	3	2.5	2	1.75	n/a	6
MAD after Pre-pasteurisation	4.5	4	3.5	3	n/a	7
MAD after Acid Hydrolysis	4.5	4	3.5	3	n/a	7
MAD after Thermal Hydrolysis	7	6.5	6	5.5	5.5	14

* mesophilic anaerobic digestion

x surplus activated sludge, arising from the UWWTD treatment route.

- VFA (volatile fatty acid) concentration: There is no specific range for VFAs as it depends on the feedstock. It is used as an indicator of digester health rather than a process control. The production of organic acids depends on the volume of solids fed to the digester. The typical range for VFAs in a primary digester is between 50 and 800 mg/L. When VFA concentrations climb above 1000 mg/L, the digester could be overloaded or experiencing other problems.
- Ammonia - Ammonia concentrations of 50 to 1000 mg/L are beneficial, but ammonia levels of 1500 to 3000 mg/L (pH greater than 7.4) could be inhibitory but not always. An ammonia concentration higher than 3000 mg/L for prolonged period is toxic.
- VFA to Alkalinity ratio: Very important parameter to monitor for digestion process. The VFA to alkalinity ratio of below 0.4 is good and above this threshold value means diminishing alkalinity and low pH i.e. sour digester content. As long as this ratio is maintained higher VFA, and alkalinity digester content can be acceptable, and the digestion process is deemed healthy. Anaerobic digestion process is always controlled based on holistic parameters based but not based on single parameter.

Odour monitoring is carried out following receipt of an odour complaint. See section 6.3 Investigation a complaint for full details. Should an influx of odour complaints be received, the need for proactive monitoring will be assessed.

Further details of routine monitoring tasks are included in the Site Operating Manual.

4.5 Record Keeping

Records of routine inspections, site and sludge inspection rounds and sludge blanket checks are kept on the site ELogbook. Records of skip management, which collect wastes generated from UWWTD activities, and any spillages and remedial actions are held in the site diary. Sludge blanket levels are recorded on run charts and electronically via the Cockpit. The site has a SCADA system.

All records of the installations such as specific O&M manuals for the odour control plant, P&IDs etc. are all kept within the Reading STW library, a dedicated storage facility.

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Site and sludge rounds are kept by Thames Water Asset Management, and details can be found in the SOM.

A monthly condition report on the OCUs is sent to the team manager by the contractor and stored on SharePoint.

4.6 Emergency Response and Incident Response Procedures

Emergencies such as fire, flood and severe weather are managed by Thames Water's Incident Management and Business Resilience team. The processes employed can be found on Thames Water's SharePoint site and are entitled: 'Incident Management Arrangements'. This is a company confidential document and therefore, is not included in the Appendices of this document.

Hazard reporting and accidents are all recorded on the Health and Safety software database SpheraCloud (<https://sphera.com>) and monitored by Thames Water's Safety, Health & Wellbeing team.

In the event of power failure, the site will run on island mode for critical plant. However, as this doesn't include the BNR odour extraction fans there is a potential temporary risk of odour until power is restored.

Absence of key staff should not affect the running of Reading STW, as Tech 1s from other sites can be called upon to cover, if required.

Odour mitigation for emergency events have been detailed in Table 4.6. The purpose of Table 4.2-4.6 shall be to identify site specific emergency response procedures and mitigation measures relating to site odour generation and release as well as additional site-specific odour issues and mitigation measures associated with process stages identified under the site Odour Risk Assessment.

5 Maintenance and Inspection of Plant and Processes

5.1 Routine Maintenance

5.1.1 General Requirements

Site staff have a schedule to ensure routine maintenance for key mechanical items. In addition, a dedicated maintenance team provide additional support for more specialised equipment, e.g. regular calibration of Dissolved Oxygen probes.

In addition to the routine operational tasks, planned preventative and defect maintenance of plant is carried out. Plant which may have an impact on odour release is assigned an appropriate criticality rating to ensure effective performance is maintained. Plant assessed to be odour critical is listed in Section 4.2.3 above.

All maintenance procedures are detailed in the SOM, and when carried out is captured on the corporate system SAP, which generates work requests for the various activities for the treatment process assets at the appropriate frequency.

5.1.2 Maintenance and Monitoring of Odour Control Units

Operation and maintenance of OCUs is delivered in accordance with the Company's Asset Standards and Equipment Maintenance Standards. This is either delivered in house by Operations or outsourced to contractor. Refer to the Odour Control Unit Asset Standard and Site Operating Manual for more information.

Condition of the media in the OCU is monitored by performance checks and by additional testing as required.

The OCUs at Reading STW are covered by a service and maintenance contract with a specialist Contractor. They are inspected on a monthly basis and reports are sent to site management. Figure 5.1 below highlights the scope of work required from our OCU Maintenance Contractors through their monthly visits. Monitoring during the visits is as follows:

- Monthly – flow (m³/h), differential pressure(kPa) and hydrogen sulphide(ppm) at both the inlet and outlet. Where applicable, monitoring may also include fan hours run and removal efficiency of hydrogen sulphide.
- Quarterly – VOC(ppm) and mercaptans(ppm) at the inlet and outlet.

Online H₂S monitoring on both OCU outlets. Calibrated every 6 months.

>50ppb hydrogen sulphide will be used as a threshold value for media change out.

The OCU biofilters are specifically designed to minimise the release of odour, bioaerosols and microorganisms.

Figure 5.1 – Monthly OCU Health Checks

Monthly Health Checks

Biofilter

Please enter any comments you may have in the yellow comments boxes

Number	Task	Comments
1	Examine ductwork for any signs of damage or leaks and check condensate drains are free flowing	
2	Visually inspect the Odour control system will be made and any defects or deterioration of the housings will be reported	
3	Check the airflow through the system and any anomalies investigated	
4	Measure the pressure drop across the system by measuring the inlet and outlet pressure. Record any abnormalities	
5	Measure the contaminate levels (primarily H ₂ S) at the inlet and at the stack	
6	Check visually all fans, check for excessive noise and report any necessary maintenance to be undertaken as applicable	
7	Examine the irrigation system to ensure correct operation including spray pattern, clean the strainer and unblock nozzles or replace as deemed necessary	
8	Take a sample of the drainage water and measure the pH value and compare to target	
9	pH value (this is not pH 7 for modern biotech)	
9	Check all hatches and doors for integrity and ensure they are closed	

Chemical Scrubber

Please enter any comments you may have in the yellow comments boxes

Number	Task	Comments
1	Examine ductwork for any signs of damage or leaks and check condensate drains are free flowing	
2	Check visually all fans, check for excessive noise and report any necessary maintenance to be undertaken as applicable	
3	Visually inspect the Odour control system will be made and any defects or deterioration of the housings will be reported	
4	Check the airflow through the system and any anomalies investigated	
5	Measure the pressure drop across the system by measuring the inlet and outlet pressure. Record any abnormalities	
6	Measure the contaminate levels (primarily H ₂ S) at the inlet and at the stack	
7	Check visually all fans, check for excessive noise and report any necessary maintenance to be undertaken as applicable	
8	Examine the recirculation pumps and distribution pipework to ensure correct operation, clean the strainer and check trough / distributor	
9	Carry out a functional check of the dosing system ensuring target pH and Redox are achieved, and validate the probe calibration using a handheld unit	
10	Calibrate if necessary	
11	Visually check the seals of all hatches note any leaks	
12	Visually check the wet scrubber housing, note any significant deterioration	
13	Scrubber dosing cabinet - Check chemical dosing pumps for leaks	
14	Scrubber dosing cabinet - Check that dosing rates are correct	
15	Scrubber dosing cabinet - Check all valves, instruments and pipe-work for leaks	
16	Scrubber dosing cabinet - Check inside of cabinet for chemical residue and dirt and wash if necessary	
17	Scrubber dosing cabinet - After wash down check catch-pot high level alarm is working before draining	

Carbon Adsorber

Please enter any comments you may have in the yellow comments boxes

Number	Task	Comments
1	Examine ductwork for any signs of damage or leaks and check trapped condensate drains are free flowing. If a manual drain valve is provided, operate the valve until the flow of condensate ceases and leave valve in closed position	
2	Check visually all fans, check for excessive noise and report any necessary maintenance to be undertaken as applicable	
3	Visually inspect the Odour control system will be made and any defects or deterioration of the housings will be reported	
4	Check the airflow through the system and any anomalies investigated	
5	Measure the pressure drop across the system by measuring the inlet and outlet pressure. Record any abnormalities. Read off Delta-P gauge if fitted or using a portable manometer	
6	Measure the contaminate levels (primarily H ₂ S) at the inlet and at the stack	
7	Check visually all fans, check for excessive noise and report any necessary maintenance to be undertaken as applicable	

5.1.3 Records

Maintenance history records are kept electronically on SAP or the company's SharePoint system.

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5.2 Fault Reporting

Faults identified during routine inspections are reported to the Performance Manager who assesses criticality before entering the task into the job scheduling system for allocation to an appropriate person to a timescale appropriate to the criticality.

5.3 Emergency Repairs

24-hour maintenance cover is available at the discretion of the Performance Manager or Duty Manager, with planned follow up.

Less urgent repairs are assessed for criticality and dealt with during normal working hours.

6 Customer Communications

6.1 Customer Odour Complaints Process

Customer contacts regarding Reading STW will be made via the Customer Services Centre, Operations will investigate and take appropriate action. Complaints may also be received from the local council and Environment Agency.

Customers / residents are encouraged to communicate with local Thames Water Operations via the Customer Centre to report if they are noticing odour from Reading STW, to ensure that all contacts are recorded and actioned.

Customers have 3 main options to report complaints to Thames Water:

1. Thames Water Website – “Report A Problem” at <https://www.thameswater.co.uk/contact-us/report-a-problem/report-a-problem-online>.
2. Email - customer.feedback@thameswater.co.uk with the subject ‘Reading Sewage Treatment Works’
3. Telephone - Thames Water Customer Services 0800 316 9800

If the customer / resident would prefer to contact Reading Borough Council their contact details are as follows:

Reading BC – Environmental Services (Direct Contact Centre)
Telephone: 0118 937 3787

For permitted sites:
Environment Agency
Incident hotline: 0800 80 70 60
Email: incident_communications_service@environment-agency.gov.uk

Customer contacts regarding Reading STW that are received directly on site are responded to by the local Operations team. The Performance Manager, at the earliest opportunity, will inform the Customer and Stakeholder Manager (CSM) of the contact details in order that they can ensure the complaint is captured and recorded by the Customer Services Centre.

Complaints received via Customer Services Centre:

- Complaint information is logged electronically by the Customer Services Centre.
- An action is raised to Waste Operations Control Centre (WOCC) who contact the CSM by telephone and email the complaint information to both the CSM and Performance Manager
- The Performance Manager and CSM will review the complaint and take action to investigate (see section 6.3)

- The CSM is responsible for contacting the customer and updating them on the outcome of the investigation.
- Any problems are noted and remedial work actioned. An update of action taken and feedback given to the customer is emailed to the WOCC by the CSM.
- The WOCC update the electronic complaint report and it is closed down.

Complaints received via email or post:

- Complaint information is logged electronically by Customer Relations and allocated a Case Manager.
- The complaint is emailed to the CSM who reviews the complaint and investigates with the Performance Manager (see section 6.3).
- Actions taken are emailed back to the Case Manager who updates the electronic system and updates the Customer.

Complaints received via Customer Centre out of normal working hours

- For a large number of calls, or serious concerns, the Out of Hours Coordinator will be contacted to respond.
- For all other calls Reading STW site management will investigate and respond the next working day.

6.2 Customer Communication Plan

The Customer Communication Plan in Appendix 3 identifies how and when contact will be made with customers and stakeholders in relation to stable, abnormal and emergency site operation.

6.3 Investigating a complaint

Upon receiving a complaint Thames Water have 24 working hours to respond to the customer with an update. Within these 24 hours, the CSM will contact to the Performance Manager who will carry out an investigation to determine whether the odour source is coming from the Thames Water site. If the odour is decided to be from the Thames Water site, then the root cause is investigated.

Should the source of the odour be confirmed as coming from the Thames Water Operations then the Performance Manager will review all activities currently taking place on site, including any maintenance, cleaning, and non-standard activities to identify the root cause, and ensure appropriate mitigation measures are in place.

If the Performance Manager cannot identify the source of the odour, but complaints persist, the CSM will ensure the customer who made the complaint is contacted, and obtain further details. These details include their address in relation to the site location, the time of occurrence and for how long. If odour problems continue to persist, Thames Water may even ask the customer to keep a detailed odour diary to ensure their issue can be fully addressed.

The root cause investigation may include site walkaround checks, which look for irregularities such as spillages / open doors and hatches, ensuring appropriate measures such as detailed in table 4.2 are in place. It may also include off-site visits to the Customer location.

When the root cause of the odour is found, the Customer will be updated with an explanation and provided with a timescale for its resolution. Furthermore, the situation is assessed for hazards to determine any possibility of health risk to the local community.

To ensure any limitations regarding everyday staff becoming desensitised to the odour, if site odour complaints persist with no result in locating its source, personnel who do not spend prolonged time on a single site, such as the Area Operations Manager, will participate in the walkaround checks.

6.4 Notification of Operations with Potential to Cause an Odour Problem

Where operations may impact on local residents, notification will be made to the Customer Centre who will log the details on their Bulletin Board. This will be used to provide information directly to customers who call with queries. Letter drops may also be used.

The Customer Stakeholder Manager will be contacted directly if there are risks of odour generation (e.g. digester cleaning, tank cleaning or process issues). NOTE: This will only take place on known sensitive sites where Local Authorities and the EHO are already involved.

For assets under STC permit, we notify the EA in accordance with the permit conditions and notifications procedure, see appendix 3.

If notified by the Environment Agency that the activities are giving rise to pollution outside the site due to odour, Thames Water shall investigate and carry out a review of the OMP and appropriate measures if deemed necessary.

Appendices

Appendix 1. Odour Risk Assessment



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Appendix 2. Odour Improvement Plan

Odour Improvement Plan Reading STW						
Review Date		Jun-22				
Process Stage	Owner	Summary - Plan	Action	Challenges	Measures to mitigate	Timescale for completion
ASP		ASP covers	ASP cover access hatches Risk: 93285 £156K. Looking at different covers, due to technical challenge back from the business. Some covers have been removed due to affects to operational process	Other priorities/ cost for the hatches		AMP7
Standby carbon filter		Carbon Filter refurb	To refurbish standby carbon filter Risk: 118100. Quotes being chased.	Funding approval	OCU working and standby not required at present	AMP7
General pipework and ducting		General pipework and ducting overall	Look at the assets with the view to actioning	Funding approval		AMP7
OCUs		OCU stacks	Re-instate collapsed Inlet OCU stack. Root cause has been assessed and confirmed as fracture at the joint as opposed to corrosion and bolt failure. Condition assessment important to understand potential risk with the two further OCU stacks. Risk 124811, funding approved for reinstatement of the Inlet OCU stack - 40 week lead time from agreement of a delivery contact.	Investigation into condition of other two stacks is required.	OCUs still functioning. The two other stacks are being structurally supported.	Dec-23

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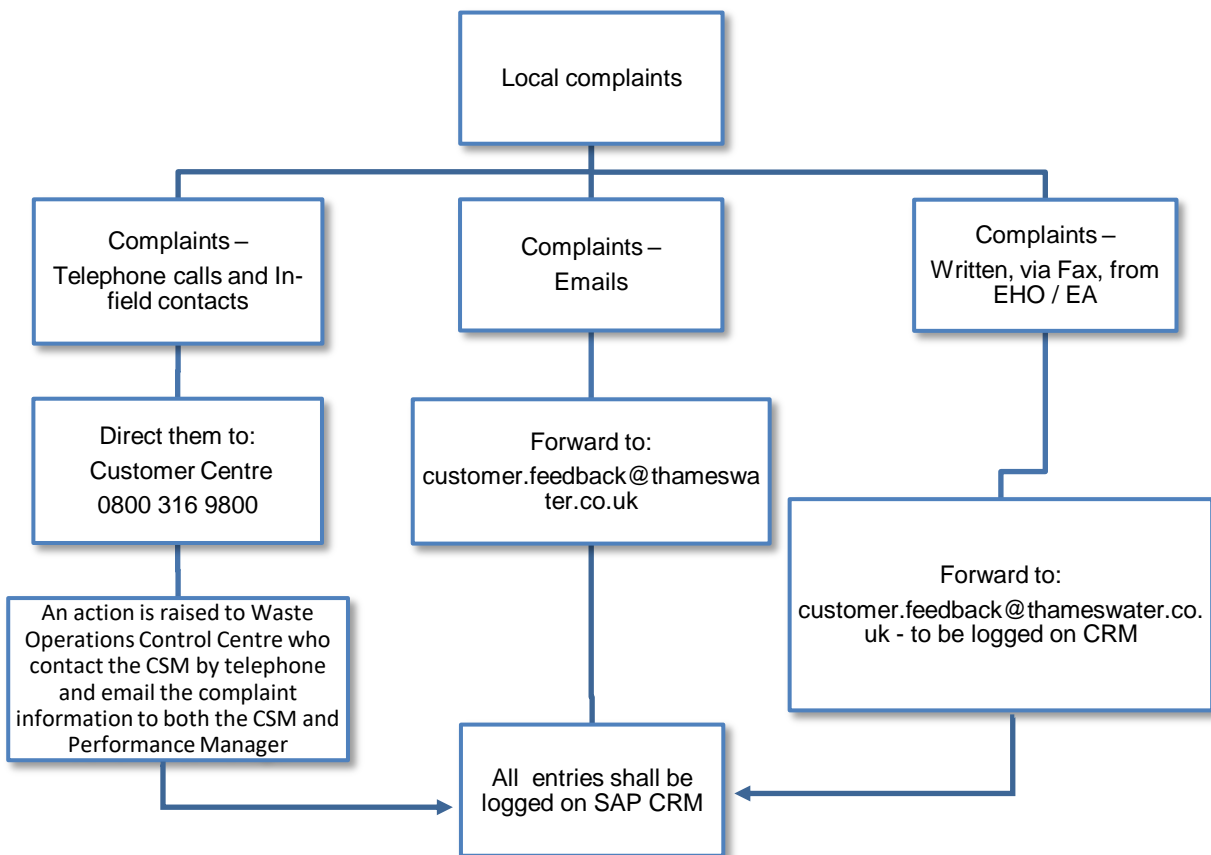
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Appendix 3. Customer Communications Plan

Complaints Process

All locally received complaints are re-directed to the Customer Centre. Please refer to figure below for details.



IMPORTANT NOTE:	
Any communications received from the local Member of Parliament or senior council officers need to be forwarded to the Local/Regional Government Liaison person.	
Name:	
Telephone:	

Communications

Level 1	Stable operations: Compliant with Operational Asset Standards.			
Communications Approach	Standard regular proactive contact with key stakeholders.			
Stakeholders External	Frequency of Contact	Method of Contact	Aim of Contact	TW Contact/Level
Local council(s) Environmental Health Department	As required but at least quarterly	Telephone / email / meeting	Update on operational activity on site	Performance Manager and Customer Stakeholder Manager
Environment Agency	As required.	Telephone / email / meeting	Update on operational activity on site	Performance Manager and environmental permitting team
Local residents associations (<i>if applicable</i>)	As required but at least annually	Telephone / email / meeting	Update on operational activity on site	Performance Manager and Customer Stakeholder Manager
Stakeholders Internal	Frequency of Contact	Method & Level of Contact	Aim of Contact	TW Contact/Level
Press Office	As required	Report sent out by operations to the business	Update the business on operational activity on site	Duty Manager
Customer Centre (Swindon)	As required	Report sent out by operations to the business	Update the business on operational activity on site	Duty Manager

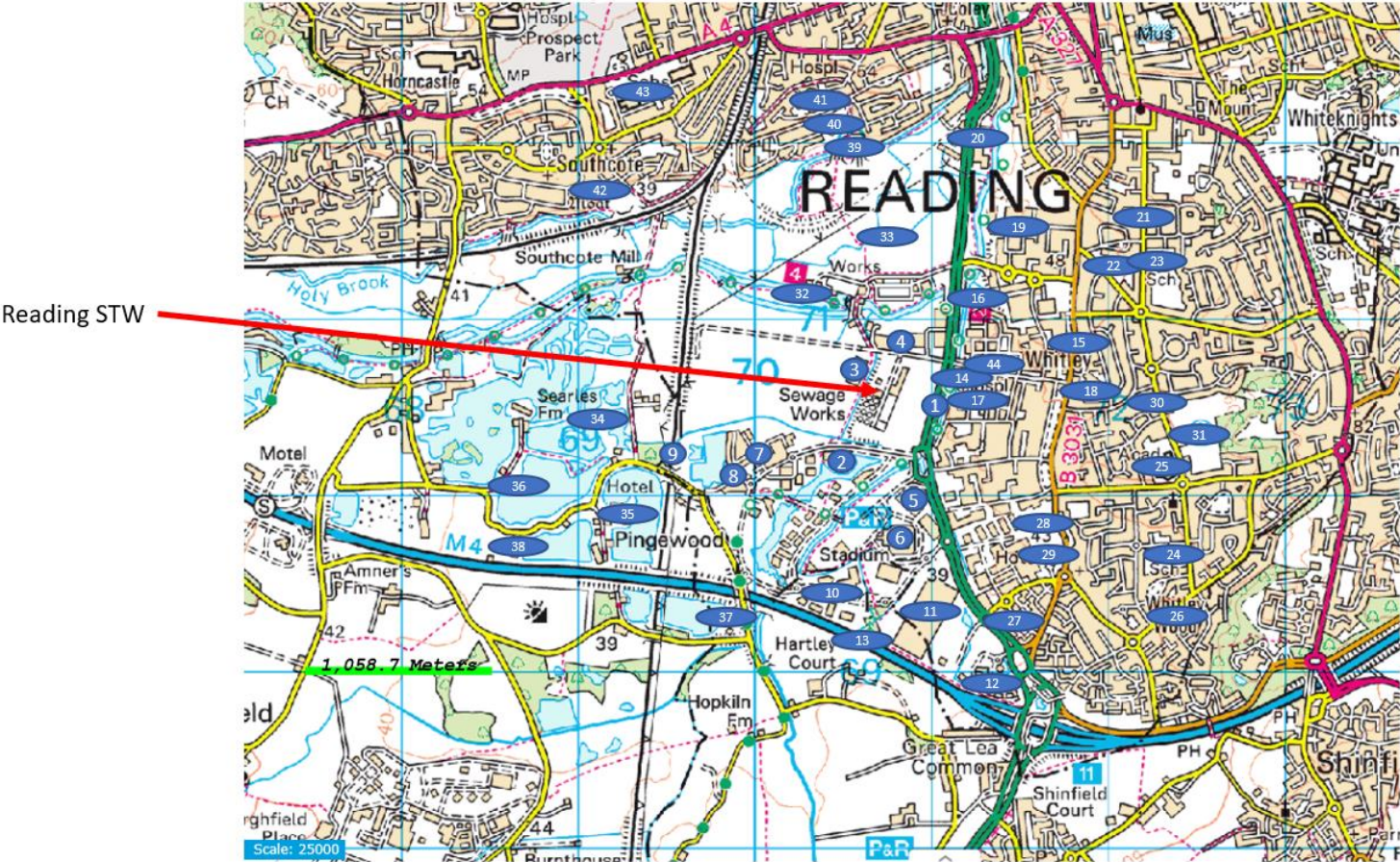
Level 2	Unstable operations: <ul style="list-style-type: none"> Non-compliant with Operational Asset Standards on one or more sub-processes leading to increased odour risk. 			
Communications Approach	As Level 1 plus: <ul style="list-style-type: none"> Use of Contact Centre Bulletin Boards / Briefing Contact Centre agents / Briefing statement with Q&A prepared for the press office (to use reactively). Monthly discussions with, and quarterly visits from, the EHO. Commence proactive communications with other stakeholders. 			
Stakeholders External	Frequency of Contact	Method & Level of Contact	Aim of Contact	TW Contact/Level
Local council(s) Environmental Health Department	Immediately then monthly	Telephone / email / meeting	Report unstable operation with action plan	Performance Manager and Customer Stakeholder Manager
Local residents associations (<i>if applicable</i>)	Immediately then monthly	Telephone / email / meeting	Report unstable operation with action plan	Performance Manager and Customer Stakeholder Manager
Environment Agency	Potential for notification procedure	As required as per notification procedure	As required as per notification procedure	Pollution desk
Stakeholders Internal	Frequency of Contact	Method of Contact	Aim of Contact	TW Contact/Level
Press Office	Immediately then weekly	Q&A prepared for press office by Operations	To enable the press office to deal with queries from the press (reactive only).	Duty Manager
Customer Centre (Swindon)	Immediately then weekly	Telephone / email	To enable the Customer Centre to deal with queries from the press (reactive only).	Duty Manager
Other areas/stakeholders outside Reading STW potentially impacted				
Stakeholder	Frequency of Contact	Method of Contact	Aim of Contact	TW Contact/Level
Local businesses	Immediately then monthly	Telephone / email / meeting	Report unstable operation with action plan	Performance Manager and Customer Stakeholder Manager

Level 3	Emergency <ul style="list-style-type: none"> Temporary or transient activities not deemed to be compliant with Operational Asset Standards. High risk of odour emitting plant. 			
Communications Approach	As level 2 plus: <ul style="list-style-type: none"> Odour event set up internally (including OOH's cover from OMC (Kemble Court)). Weekly discussions with EHO. Monthly Stakeholder meetings, (internal and external – include MPs, Councillors, schools, businesses etc.). Press release may be required. 			
Stakeholder External	Frequency of Contact	Method of Contact	Aim of Contact	TW Contact/Level
Local council(s) Environmental Health Department	Immediately then weekly	Telephone / email / meeting	Report emergency event with action plan and update with progress	Level 5 (Operations Manager) /4 Manager (Regional Operations Manager)
Local residents associations (if applicable)	Immediately then monthly	Telephone / email / meeting	Report emergency event with action plan and update with progress	Performance Manager and Customer Stakeholder Manager
Councillors / MPs for local areas	Immediately then monthly	Telephone / email / meeting	Report emergency event with action plan and update with progress	Level 5 (Operations Manager) /4 Manager (Regional Operations Manager)
Environment Agency	As required as per notification procedure	As required as per notification procedure	As required as per notification procedure	Pollution desk
Stakeholders Internal	Frequency of Contact	Method of Contact	Aim of Contact	TW Contact/Level
Press Office	Immediately then daily	Q&A and press release prepared by press office	To enable the press office to deal with reactive queries from the press and prepare a media strategy if required.	Duty Manager
Customer Centre (Swindon)	Immediately then daily	Telephone / email	To enable the Customer Centre to deal with queries from customers (reactive only)	Duty Manager

Other areas/stakeholders outside Reading STW potentially impacted				
Stakeholder	Frequency of Contact	Method of Contact	Aim of Contact	TW Contact/Level
Local businesses	Immediately then monthly	Telephone / email / meeting	Report emergency event with action plan and update with progress	Process / Site Manager

Appendix 4. Site Drawings

Figure A – Site Location Map Including Receptors from Table 2.1

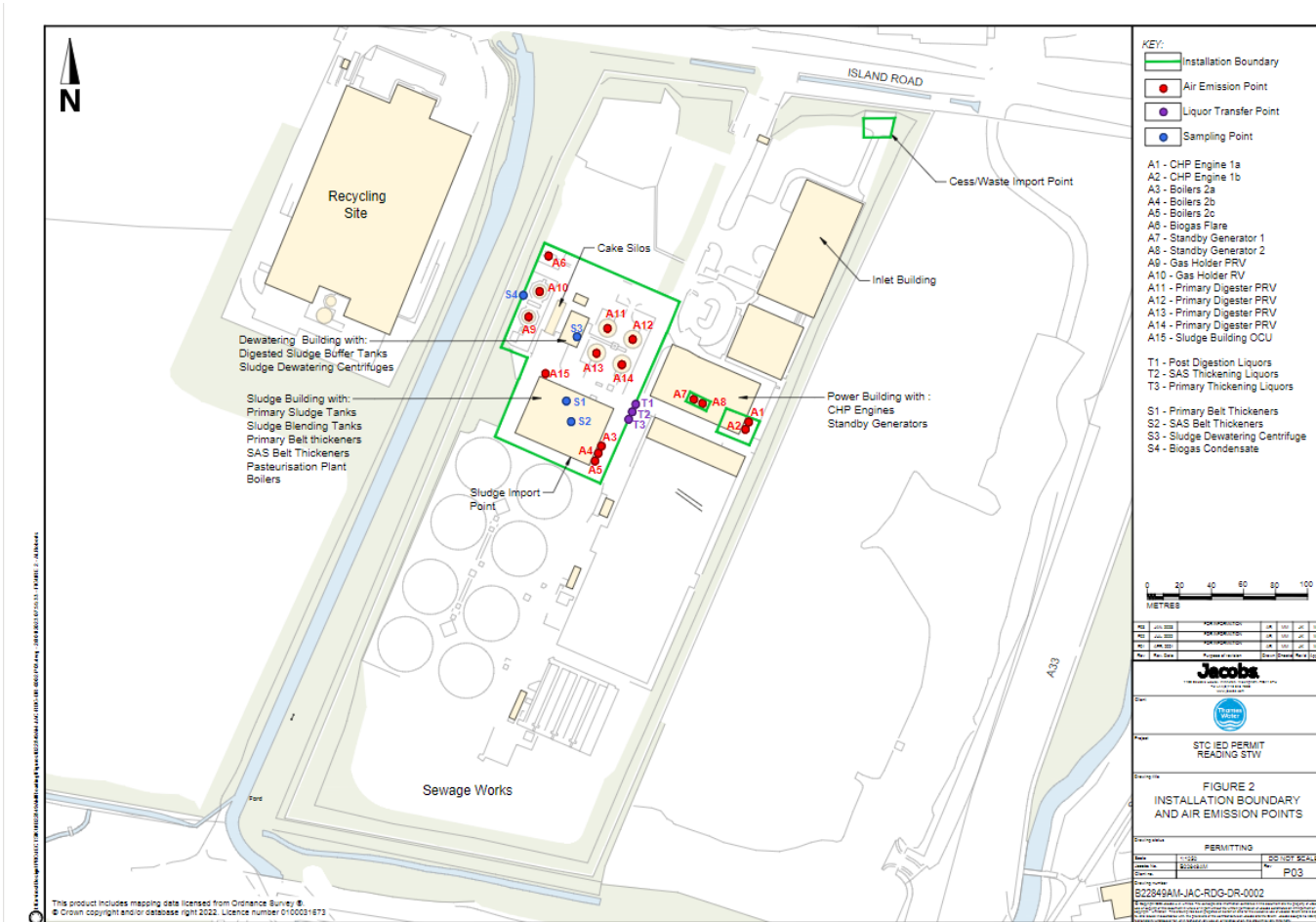


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Figure C – Area Permitted Under Sludge Treatment Centre Permit

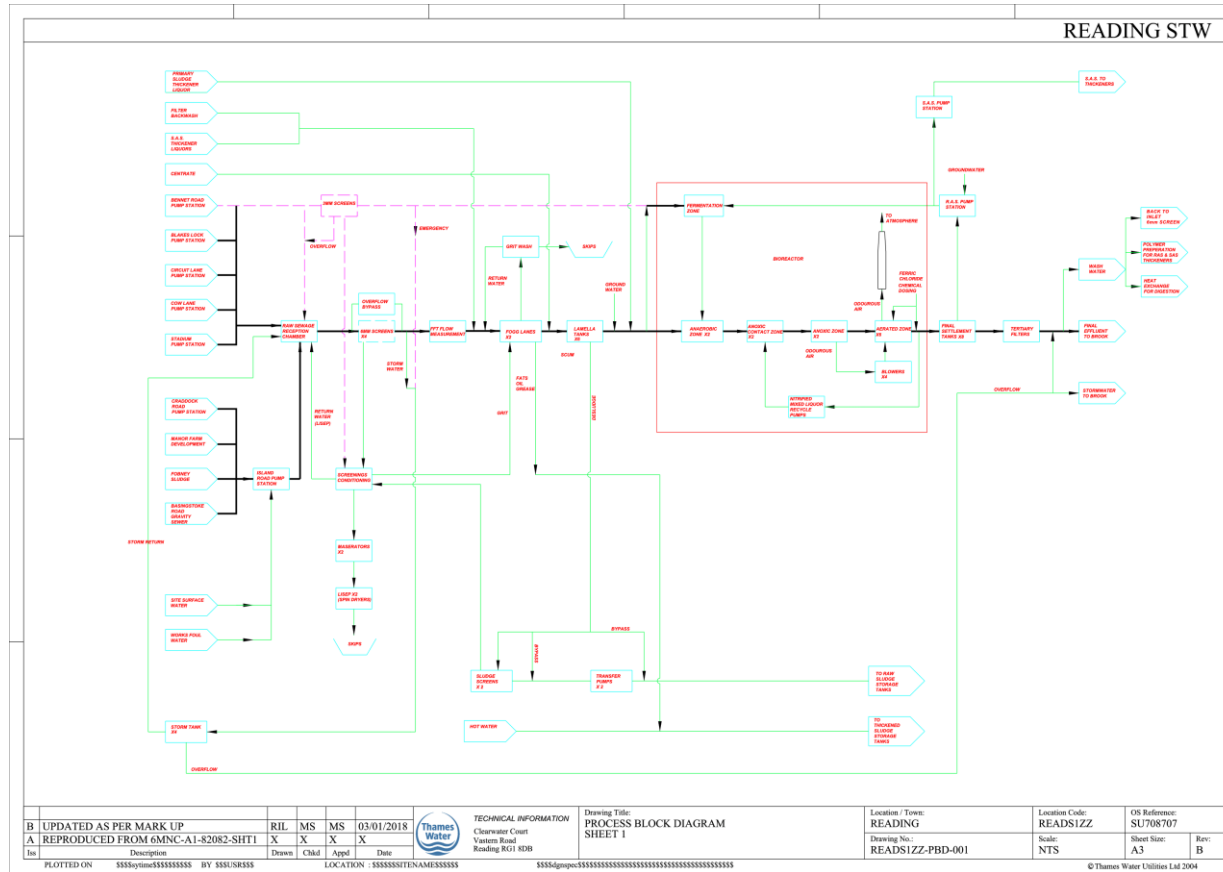


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Figure D1 - Process Block Diagram for UWWTD Processes



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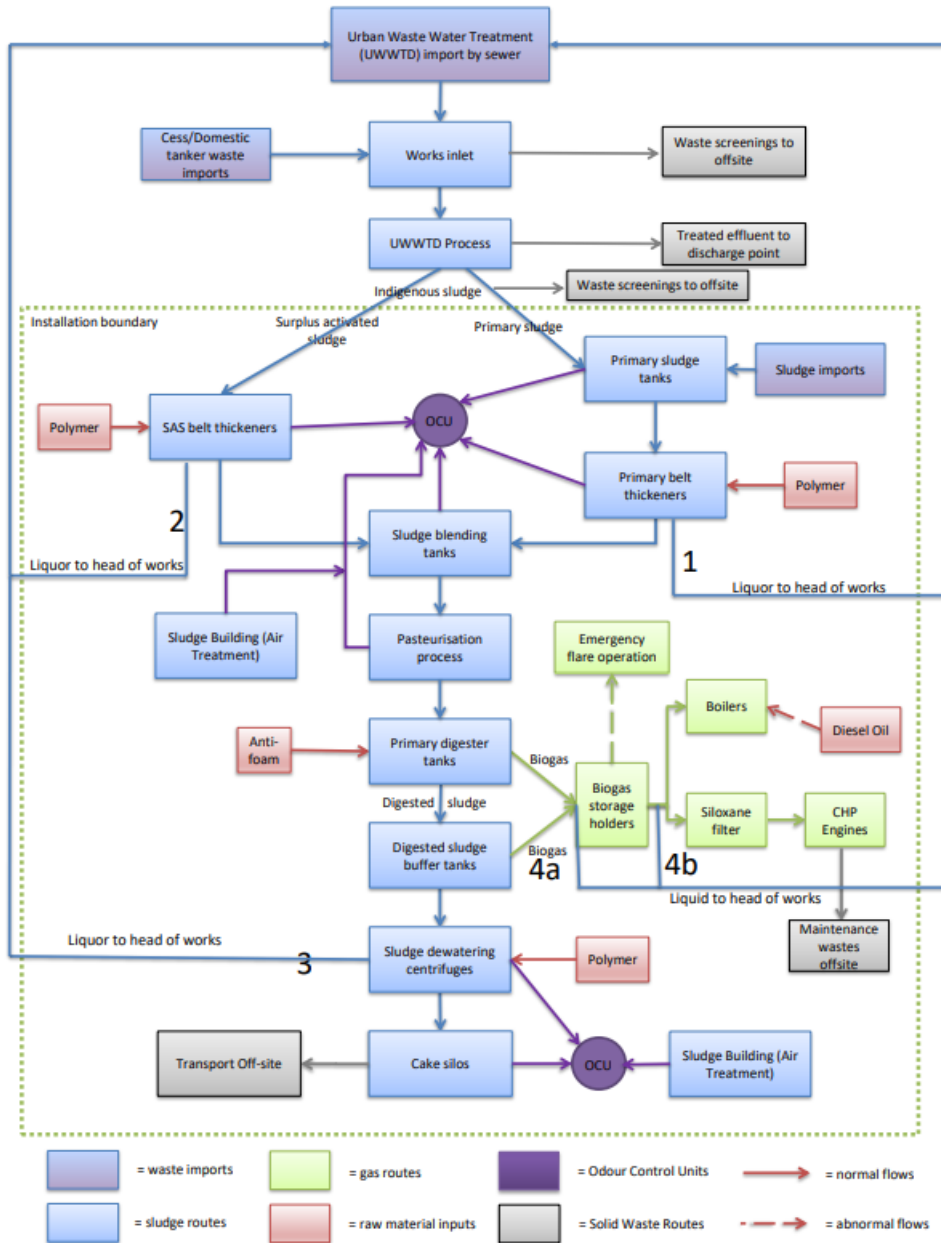
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Figure D2 - Process Block Diagram for permitted activities



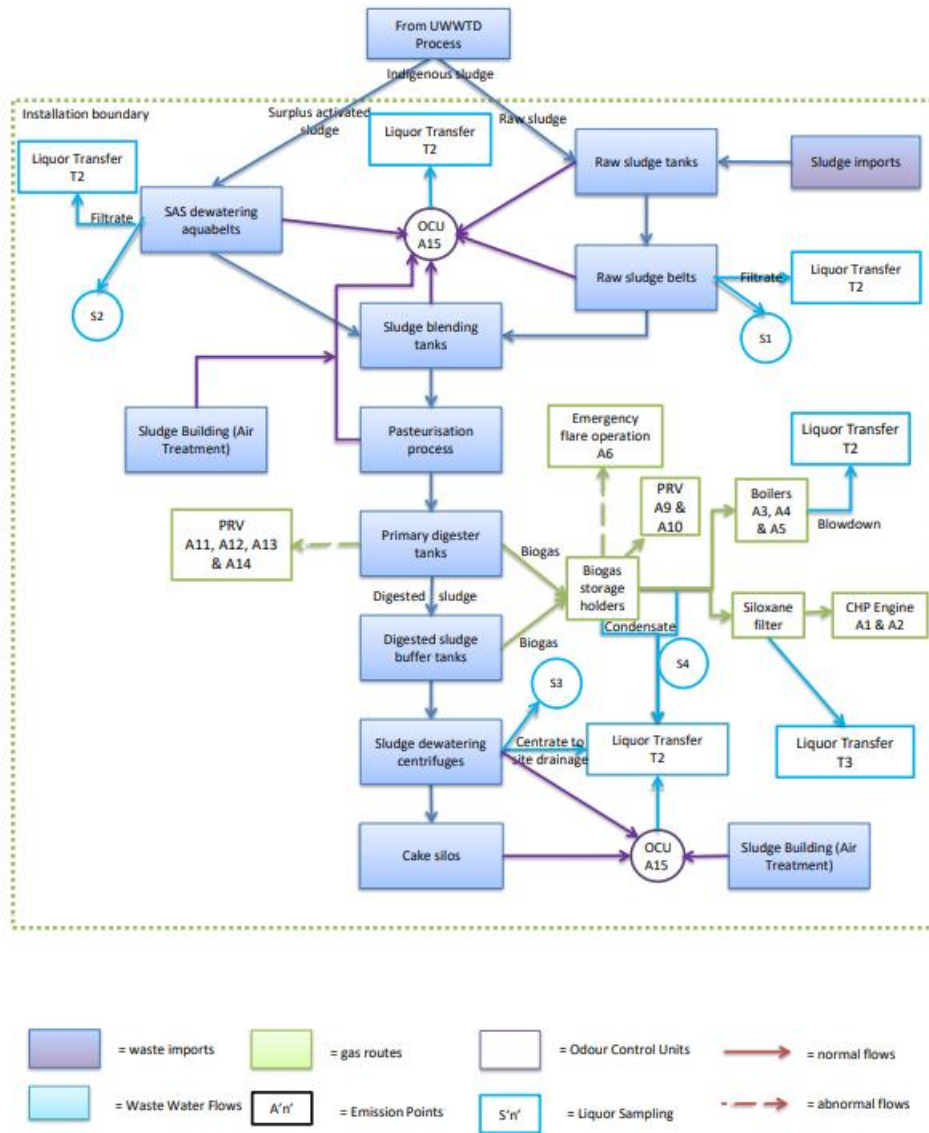


Figure D3 - Process Block Diagram for Whole Site



Reading BFD (1).pdf

Appendix 5. Generic Site Round Checks

ID	Instruction	Daily	Weekly
1	Final Effluent		
a)	Check the effluent quality at the sample point. Sample (ammonia, phosphorus, temperature & turbidity) in accordance with SOM. Record in site log book & via Direct Text.	X	
b)	Check final effluent sampling point is accessible. Highlight to manager if need to clean inline monitor, channel/chamber.	X	
c)	Check storm sampling point is accessible. Highlight to manager if need to clean inline monitor, channel/chamber.	X	
d)	Visual check on point of discharge to the watercourse if accessible. Check operability of outfall flap valve if fitted.	X	
e)	Check storm discharge point, if shared & if accessible.	X	
f)	Compensation water pumps. Check and clear ultrasonic head of cobwebs etc.	X	
g)	Check data and operation of inline monitor. Check inline monitor installation for damage, take appropriate action where required.	X	
h)	Remove and clean inline monitor probe.		X
i)	Check flow meter & flume is clear of debris. Take appropriate action.	X	
2	Preliminary Treatment	Daily	Weekly
a)	Check Crude sewage appearance. Does it look normal for the site?	X	
2.1	Cess Waste Reception Point		
a)	Note any suspicious activity or discharges as required	X	
b)	Check logger system is operating correctly	X	
c)	Check all pipework is in good condition	X	
d)	Where a macerator is fitted, check operation and oil reservoir	X	
e)	Where a manual stone trap is fitted, clear of accumulated material	X	
f)	Check grit bins are available and stocked with grit for winter	X	
g)	Carry out general housekeeping, remove litter, clear debris, washdown any spillages, empty bins	X	
h)	Ensure all signage is in good condition, clean and legible	X	
i)	Check washdown equipment is operating correctly	X	

ID	Instruction	Daily	Weekly
2.2	Inlet / storm pumping station	Daily	Weekly
a)	Check Ammeter reading, Too high could indicate a blockage. Too low could indicate an air lock or impeller damage. Where reading is unusual ensure appropriate action is taken.	X	
b)	Check the well level is within the normal operating limits taking into account the flow conditions at the time (such as storm conditions & peak flow to site). If level is too low or high, this could indicate control issues or pumping issues.	X	
c)	Check condition of the wet well. Does it have more than the usual scum or debris floating on top that will indicate the need for a wet well clean?	X	
d)	Check fault light(s) are not on, take appropriate action as required.	X	
e)	Check flow rate (where meter is fitted); is it within the normal operating range?	X	
f)	Inspect buildings, kiosks and control/switchgear panels for general condition, damage and that they are securely locked. Clean and tidy the interior of the buildings and/or Kiosks. Remove rubbish from site or if large volume arrange for collection.	x	
g)	Listen for undue pump noise and check for undue vibration by safely touching the lifting chain or guide rail.	X	
h)	Check non-return valve is operating correctly Non return valves prevent water from flowing back through the pump when it is not in operation. If a weighted arm is fitted is it at the usual angle? If it is low and chattering it could indicate the pump is blocked.	X	
i)	Check operation of the ultrasonic level control. Is it reading correctly? Compare the well level with the normal readout from the display. Check hard wired control floats, clean as required. Are floats weighed down with rag or debris preventing them from lifting if the water level rises?	X	
j)	Check pumps, pipelines and couplings for leaks where possible.		X
k)	Start the cleaning cycle manually where required.	X	
l)	Pumps - Log hours run		X
m)	Pumps - Log kWhrs		X
2.3	Screen(s) / macerator(s)	Daily	Weekly
a)	Check inlet channel level is normal taking into account the flow conditions at the time (such as storm conditions & peak flow to site).	X	
b)	Check screen operation and check for screenings carryover.	X	

ID	Instruction	Daily	Weekly
	Check for blockages and blinding (hairpinning) on screen panels and remove where necessary. Check for rag rolling or rag balls upstream of the screen and remove where necessary. Check for any grit build up in front of screen		
c)	Inspect debris disposal mechanism for correct operation and verify screenings are being removed. Check & clean any obstructions impeding the operation of screen mechanisms.	X	
d)	Check screens bypass is available and clean	X	
e)	Clean area around screen. Check & clean screen panels of any obstructions.		x
f)	Visually check auto lubrication systems (grease pot) are functioning correctly, take appropriate action to replace them if needed. Inspect grease pots and fill them when level is below the standard. Use grease nipples to lubricate required parts of screen.	X	
g)	Visually check unit and its associated equipment for the following: Safety & security with all panels locked & guards secure and in good condition. Excessive noise or vibration Overheating External damage, leaks, missing fixings Where applicable, ensure main and brush drives turn and that brushes are spinning	X	
h)	Check operation of wash water system for screens Ensure wash water pressure of spray bar is correct. Check the inline filter is present, clean and feeding the spray bars (where applicable). Check the spray bar pattern and clean the spray bar nozzles as required.	X	
i)	Check & clean accumulation of screenings and fat from debris disposal mechanism Check & clean launder chutes and channels for accumulation of grit, sand, rag, fat,	X	
j)	Check the lip, labyrinth or other seals between the screen and the channel wall are making an effective seal.	X	
k)	Visual check on the screenings removal brushes for blinding and wear. Clean the brushes as required. Ensure the brushes are in correct contact with the screen and that screenings are being removed.	X	
l)	Check and clean instrumentation probes, floats and ultrasonic heads (where applicable).	X	
2.4	Screenings handling	Daily	Weekly
a)	Check control system and amps on panel for normal levels /	X	

ID	Instruction	Daily	Weekly
	operation, take appropriate action as required. Jumping amps indicates a blockage.		
b)	Where installed, visual check for normal operation of macerator. Look for visible blockages/build up on unit, high flows in front of macerator. Listen for unusual noise. Take appropriate action as required.	X	
c)	Where installed, check and empty stone trap.	X	
d)	Clean area around screenings handling units and skips.		X
e)	Check operation of wash water system for screenings handling. Check the inline wash water filter is present, clean and feeding the spray bars (where applicable) Ensure wash water pressure of spray bar is correct. Check the inline filter is present, clean and feeding the spray bars (where applicable). Check the spray bar pattern and clean the spray bar nozzles as required.	X	
f)	Check screenings product quality and quantity, Check level of screenings in skip and change skip when full.	X	
g)	Check operation of auto drain.		x
h)	Where installed check operation of the trough desludge system. Check for grit build-up in trough - hose out where required.		x
i)	Visual check on condition and operation of brushes (ensure trough is being cleaned). If blinding occurs regularly have wear on screw brushes checked.		x
j)	Check screw conveyor and brushes for wear and central running.		x
k)	Clean and check mesh for blinding and hairpinning.		x
2.5	Grit removal	Daily	Weekly
a)	Check mechanical plant is operating correctly. Check equipment– Compressor, Rake, Detritor & Pista grit.	X	
b)	Check manually de-gritted constant velocity channels for build-up of grit, take appropriate action as required.	X	
c)	Check inflow and outflow for normal rate of flow and correct distribution.	X	
d)	Check volume, dryness and quality of grit produced.	X	
e)	Remove rag from the areas around baffles and mechanical equipment	X	
f)	Log manual de-gritting operations where required.	X	
g)	Log abnormal grit volumes.	X	
h)	Clean grit channel as required. Check grit build up in inlet channels and clean out if necessary.		X

ID	Instruction	Daily	Weekly
i)	Check operation of wash water system and check the inline filter is present, clean and feeding the spray bars (where applicable)	X	
j)	Check aerated grit channels for air flow and bubble pattern (where applicable).	X	
2.5	Skips	Daily	Weekly
a)	Check skip capacity is adequate, and inform contractor when skip is full.	X	
b)	Rake skip where required.	X	
c)	Remove excess water if there is a facility to do so.	X	
d)	Ensure only prescribed material is in the skip. Remove any materials not prescribed.	X	
2.6	Storm separation and treatment	Daily	Weekly
a)	Check Flow To Full Treatment penstock is set at correct level.	X	
b)	Check storm return system is operational, manually return storm contents where required.	X	
c)	Check storm tanks cleaning system, check level sensors, check tanks are clean and empty outside of storm conditions.	X	
d)	Check and clear storm screens where required. (automatic clearance and manual clearance linked to safe system of work)	X	
e)	Check screens bypass is available and clean	X	
f)	Check and clear/replace any outlet screening sacks		X
g)	Check separation weirs and clean where required.		X
h)	<u>During storm</u> check that the flow to treatment is normal. (Treating Flow To Full Treatment)		X
i)	Log abnormal flows. Log storm discharge flows. Log storm flows in dry weather conditions.		X
j)	Log storm events.		X
k)	Remove any debris in the system.		X
l)	Storm LTA – Visually check area is clean and operating within site parameters. Remove any debris.		X
m)	Storm LTA – Check for short circuiting during operation. Inspect banks for leakage		X
2.7	Flow measurement	Daily	Weekly
a)	Check site is within flow permit (treating Flow To Full Treatment before going to storm). Check that flow is going through site as expected.	X	
b)	Check flow meter and flume and clean where required	X	

ID	Instruction	Daily	Weekly
c)	MCERTS – Log & record flow meter readings	X	
d)	Check EDM (Event Duration Monitor) sensor is clean and weir is free of debris	X	
3	Primary Treatment- Primary Settlement Tanks	Daily	Weekly
a)	Check and log sludge level by dipping tanks (Mon/Wed/Fri)	X	
b)	Check bridge/scrapper operation	X	
c)	Check de-sludge pump(s) and timer for normal operation	X	
d)	Check scum boards for breaks or carry under	X	
e)	Check scum trap for normal operation and clean/hose out	X	
f)	Check settled sewage quality (visual check only)	X	
g)	Check stilling chamber for rag, clear as necessary	X	
4	Secondary Treatment		
4.1	Secondary Treatment – Activated Sludge	Daily	Weekly
a)	Check air filters indicators for normal readings. Check blower control panel. Check the blowers for normal operation. Check there are no illuminated fault lights.	X	
b)	Check and record dissolved oxygen (D.O) readings, where probes are installed.	X	
c)	Sample, measure and record Mixed Liquor Suspended Solids (MLSS) /RASS concentration and sludge settleability (Stirred Specific Volume Index) (SSVI), (Monday/Wednesday/Friday)	X	
d)	Vent condensate from air lines		X
e)	Check SAS pump(s) are operating correctly	X	
f)	Check and record sludge return from the final settlement tanks (RAS rate)	X	
g)	Check D.O probe and / or timers are carrying out the correct control functions. Aeration control function.	X	
h)	Check flow distribution to aeration lanes if more than one lane present	X	
i)	Log changes to RAS rate, Log flows (where meters are fitted), Log KWh, Log SAS Rate.	X	
j)	Check and record bubble pattern and size of the bubbles	X	
k)	Check mixers for rotation in anoxic (un-aerated) zones	X	
l)	Check recycle pumps are running, as required (Biological Nutrient Removal -BNR plants)		X
m)	Check redox monitor is operating correctly (BNR plants)		X

ID	Instruction	Daily	Weekly
n)	Check VFA / liquor return (BNR plants)		X
o)	Check and record rate and frequency of SAS removal	X	
p)	Withdraw the D/O probe from the tank and remove clean		X
4.2	Secondary Treatment – Biological Filters	Daily	Weekly
a)	Visually check for correct flow distribution across the filter (radial distribution)	X	
b)	Keep filter surface clear of all debris and any significant moss or weed growth. Deal with ponding as appropriate.	X	
c)	Where recirculation is installed, check for normal operation at the correct flow rate	X	
d)	Check all air vents and under drains are clear and not flooded	X	
e)	Clear distribution arm orifices and or weir plates of debris	X	
f)	Remove end caps and rod/flush arms - clear debris from open channel arms	X	
g)	Check for appropriate flow distribution between filters to suit filter size	X	
h)	Check operation of distributor arms (uniform speed of rotation)	X	
i)	Check for leakage at the centre column seals and end caps. Short circuiting etc.	X	
j)	Check rotation timer. Check alignment of rotation alarm sensor and target plate	X	
5	Secondary Settlement – Humus Tanks / Final Settlement Tanks	Daily	Weekly
a)	Check correct operation of desludging pump(s) or valve(s)	X	
b)	Check scraper/bridge operation where installed	X	
c)	Check and log blanket level with portable blanket meter where detectors not fitted. (Monday, Wednesday, Friday)	X	
d)	Check tank surface for buildup of floating debris. Visually check effluent quality over the weir for solids carry over	X	
e)	Check RAS pump(s) are operating correctly (FSTs only)	X	
f)	Check Bellmouth and de-rag where required	X	
g)	Check effectiveness of weir brushes, chains, “other systems” where fitted	X	
h)	Check scum boards for breaks or carry under	X	
i)	Check scum removal system for correct operation, clear any fouling where necessary	X	
j)	Check flow of recirculation bleed back/constant draw off where used	X	

ID	Instruction	Daily	Weekly
k)	Check operation of fixed blanket detectors and alarms		X
l)	Check operation of Mallard pump by test running in hand, where installed		X
m)	Clear overflow weirs and launder channels of any build-up that will affect the tanks or effluent performance	X	
6	Chemical Dosing	Daily	Weekly
a)	Check that chemical is discharging, rather than dosing pump running dry (any nozzles blocked?)	X	
b)	Check chemical storage tank level - reorder as required. Log level in storage tank, Log discharge rate.		2 days a week
c)	Check for excessive vibration in the dosing pump		2 days a week
d)	Check the level in the internal bund and empty as required. Report any abnormalities.		2 days a week
e)	Visual check for leaks on tanks and visible chemical lines		2 days a week
f)	Check the trace heating system		2 days a week
g)	Check external storage tank bund for rainwater and/or chemical. Empty as appropriate.		X
7	Tertiary Treatment		
7.1	Low Head Sand Filter	Daily	Weekly
a)	Check smooth movement of bridge, unusual sounds and vibrations, and abnormal flow patterns	X	
b)	Check water level in each filter, compare with other units and relate to flow rate, and last backwash	X	
c)	Check unit isn't in bypass	X	
d)	Check for evidence of chemical leaks	X	
e)	Check cleanliness of carriage & filter area	X	
f)	Check sodium hypochlorite level in the bridge tanks where fitted and fill from bulk tank	X	
g)	Check sodium hypochlorite bulk tank level	X	
h)	Check the amount of sand in the wash water	X	
i)	Check the colour of the backwash water	X	
j)	Check the correct amount of hypochlorite is being dosed	X	
k)	Check water level in each filter, compare with other units and relate to flow rate, and last backwash	X	
l)	Log backwash timer settings and head loss	X	

ID	Instruction	Daily	Weekly
m)	Log flows and flow rate, where meters are fitted	X	
n)	Clean the level sensor head		X
o)	Log clarity of feed (compare with final effluent)	X	
7.2	Disc Filter	Daily	Weekly
a)	Log backwash pressure	X	
b)	Check frequency of backwash is within correct range		X
c)	Check bypass is not working during normal operations	X	
d)	Check depth in and out of the drum for normal operation	X	
e)	Check drum is rotating in correct mode and sounds normal	X	
f)	Check all ancillaries are operating normally	X	
g)	Log flows and flow rate where meters are fitted	X	
h)	Sample and record turbidity on feed (compare with final effluent)	X	
i)	Inspect inside filter for large pieces of debris		X
j)	Check for accumulation of weed in backwash trough		X
k)	Check and clean backwash water strainer.		X
l)	Check for soundness of mesh panels by lifting inspection panels		X
m)	Check wash water pressure and nozzles for normal operation		X
8	Raw Sludge Holding & Thickening		
8.1	Sludge Holding Tanks	Daily	Weekly
a)	Check mixing regime is correct	X	
b)	Log levels in tank(s)	X	
c)	Decant liquors	X	
d)	Check tank(s) for ragging and blockages and clear or remove (where safe access is possible)	X	
e)	Check that holes on sludge cage(s) are clear where fitted, Clean sludge cage(s) dewatering holes (where safe access is possible)	X	
f)	Log tanker movements and compare with schedule	X	
g)	Ensure any crust build up does not interfere with any control equipment/alarm floats	X	
8.2	Picket Fence Thickener	Daily	Weekly
a)	Check fence is rotating & "stop, look, listen," for mechanical issues.	X	
b)	Check weir overflow quality and the surface of the unit. Clear any buildup of debris	X	
c)	Log blanket measurements / pump timers	X	

ID	Instruction	Daily	Weekly
d)	Sample from discharge pump (run manually if necessary) and assess product quality. Sample, analyse and record % dry solids entering the PFT. Sample, analyse and record % dry solids out (Monday, Wednesday, Friday)	X	
e)	Check control system is operating normally	X	
f)	Log any changes to settings or duty	X	
g)	Log sludge flows in (where meters fitted) and out	X	
h)	Visually assess the dry solids & flow entering the PFT	X	
i)	Log hours run meters	X	
j)	Remove buildup of debris on the rake	X	
8.3	Belt Thickeners	Daily	Weekly
a)	Check for good floc formation. Check sludge on the top belt and assess the conditioning of the sludge. Check belt drainage and filtrate quality	X	
b)	Check product quality & quantity. Check condition of hopper	X	
c)	Visually check auto lubrication systems (grease pot) are functioning correctly, take appropriate action.	X	
d)	Sample, analyse & record % Dry Solids on feed and sludge/cake (Monday, Wednesday, Friday)	X	
e)	Check sludge feed rate and log	X	
f)	Check poly dosing system. Log polymer usage, note each bag change/delivery. Make adjustments to optimise	X	
g)	Ensure wash water pressure is available at a minimum of 6 bar	X	
h)	Clean belt steering paddles and check they are functioning correctly	X	
i)	Clean hopper level probes and check they are functioning correctly	X	
j)	Wash Station - Check formation of spraying fans, rotate internal brush to clean spray nozzles. (Minimum twice daily)	X	
k)	Visual Check - Hydraulic Power Pack - Check oil level and top up using clean equipment and fresh oil as required, maintain as close to full level as possible. Oil level must not be allowed to fall below 3/4 as this will cause serious damage	X	
l)	Jet wash clean the belt filter.	X	
m)	Use low pressure water hose to clean complete machine, frame, rollers and hoppers.	X	
n)	Check condition of Belt Filter for blinding / blockages / good filtration	X	
o)	High pressure steam clean the belt from underside.		X
p)	High pressure steam clean complete machine, frame rollers and hoppers avoiding all electrical and instrumentation equipment		X

ID	Instruction	Daily	Weekly
q)	Check condition of Belt Filter for wear i.e. Creasing / condition of seam to avoid failure / breakage and damage to other components		X
8.4	Drum Thickeners	Daily	Weekly
a)	Check for good floc formation. Check sludge feed rate. Check product thickness (visually). Check filtrate quality	X	
b)	Visually check auto lubrication systems (grease pot) are functioning correctly, take appropriate action.	X	
c)	Sample for % dry solids analysis and record (Monday, Wednesday, Friday)	X	
d)	Check spray bar nozzles to ensure they are clear and spraying correctly. Check spray bar wash water pressure	X	
e)	Clean probes in discharge hopper, hose down and carry out cleaning duties	X	
f)	Log polyelectrolyte used – each drum/bag change	X	
g)	Log sludge inlet flow meter, monitor throughput	X	
h)	Check & clean flocculator tanks		X
i)	Check appearance of mesh, adjust cleaning and cleaning pause intervals if necessary.	X	
j)	Clean dry solids monitors sensors		X
k)	Clean foot valves on washwater suction lines		X
l)	Clean mechanical filter on washwater booster set		X
m)	Clean washwater booster secondary screen in channel		X
n)	Jet/remove fat deposits from thickened sludge discharge pipework		X
o)	Log hours run		X
9	Odour Control	Daily	Weekly
	Tasks for all Odour Control Units		
a)	Check covers, hatches and doors are closed	X	
b)	Confirm duty fan running and standby fan availability	X	
c)	Check damper position to ensure they have not been tampered with	X	
d)	Check ductwork for any signs of damage or leaks	X	
	Specific tasks for Biofilter OCU		
e)	Check the spray pattern from the irrigation nozzles and clean nozzles where required. (If possible)	X	
f)	Check for free discharge of effluent water to drain	X	
g)	Check for free discharge on any condensate removal points	X	

ID	Instruction	Daily	Weekly
	Specific tasks for Chemical Scrubber OCU		
h)	Check water softener availability, check salt reservoir level, and top up if required.	X	
i)	Check stocks in bulk chemical tanks and reorder if required – tanker delivery	X	
j)	Check that the Redox and pH are within the agreed range – on dosing skid	X	
k)	Check duty and standby dosing pumps are available for each bulk chemical	X	
l)	Check the duty scrubber liquor recirculation pump is running and the standby is available in auto	X	
m)	Check that there is free drainage of scrubber blow-down liquor to drain	X	
n)	Check differential pressure gauges are within design range (if fitted)	X	
o)	General check for leaks in the scrubber liquor recirculation and dosing system – raise follow on work if any defects are identified	X	
	Specific tasks for Carbon OCU		
p)	Examine ductwork for any signs of damage or leaks and check trapped condensate drains are free flowing. If a manual drain valve is provided, operate the valve until the flow of condensate ceases and leave valve in closed position.	X	
q)	Check differential pressure gauge for over-pressure (if provided) – indicates media fouling	X	
10	On Site Pumping	Daily	Weekly
a)	Pumping System(s) (Drainage, Interstage, Washwater, Recirculation, Return Liquors etc.) operating correctly?	X	
b)	Check Ammeter reading - too high could indicate a blockage. Too low could indicate an air lock or impeller damage.	X	
c)	Check the well level is within the normal operating limits - taking into account the flow conditions at the time. If level is too low or high, this could indicate control issues or pumping issues.		
d)	Check condition of the wet well- does it have more than the usual scum or debris floating on top that will indicate the need for a wet well clean?		
e)	Check fault light(s) are not on	X	
f)	Check flow rate (where meter is fitted); is it within the normal operating range?	X	
g)	Check for undue pump noise and vibration by safely touching the lifting chain or guide rail.	X	

ID	Instruction	Daily	Weekly
h)	Check non-return valve. Non return valves prevent water from flowing back through the pump when it is not in operation. If a weighted arm is fitted, is it at the usual angle? If it is low and chattering it could indicate the pump is blocked	X	
i)	Check operation of the ultrasonic level gauge. Is it reading correctly? Compare the well level with the normal readout from the display.	X	
j)	Check pumps, pipelines and couplings for leaks. Check for visible leaks.	X	
k)	Start the cleaning cycle manually where required	X	
l)	Pumps - Log hours run	X	
m)	Pumps - Log kWhrs	X	
n)	Check hard wired control floats - are floats weighed down with rag or debris preventing them from lifting if the water level rises.	X	
o)	Washwater Pumping - Check the pipe line pressure from a gauge (where installed) on the pressure vessel or the pipe line manifold. Possible indication of strainer blockage	X	
p)	Washwater Pumping - Check operation of surge vessels (where installed).	X	
q)	Washwater Pumping - Check the strainers. If necessary, put automatic strainers in manual clean and inspect the manual strainers where local conditions allow.	X	
r)	Washwater Pumping - Check automatic filters are operating correctly	X	
11	Distribution Chambers	Daily	Weekly
a)	Inspect all weirs and brush clean. Remove any debris, scum, algal growth, blanket weed, grit, etc. from the chamber. Check flow split is correct.	X	
b)	Ensure any rag is removed, especially from around the penstocks, gate valves and their spindles. Ensure none of this passes over the weir.	X	
c)	Check that all valve, penstock and weir operating positions are correctly set.	X	
d)	Check chamber for any visible leaks	X	

Appendix 6. Generic Sludge Round Checks

	Instruction	Daily	Weekly
1	Liquid Sludge Import Facilities	Daily	Weekly
a)	Check sludge logger device is fully operational	X	
b)	Check that the pattern of imports is in line with site requirements/agreement with tanker operators.	X	
c)	Check general area is clean and tidy	X	
d)	Check reception tank for rag/grit build up		X
2	Sludge Screen	Daily	Weekly
a)	Check sludge screen operation	X	
b)	Check screened sludge quality	X	
c)	Check / clean moisture sensor	X	
d)	Visually check unit and its associated equipment for the following: Safety & security with all panels locked & guards secure and in good condition. Excessive noise or vibration Overheating External damage, leaks, missing fixings	X	
e)	Visually check auto lubrication systems (grease pot) are functioning correctly, take appropriate action to replace them if needed. Inspect grease pots and fill them when level is below the standard. Use grease nipples to lubricate required parts of screen.	X	
f)	Carry out checks on cold weather operation systems before frost sets in	X	
g)	Check screenings quality & quantity		X
h)	Check general area is clean and tidy		X
i)	Check washwater is operating correctly during period of sludge discharge Ensure wash water pressure of spray bar is correct. Check the inline filter is present, clean and feeding the spray bars (where applicable). Check the spray bar pattern and clean the spray bar nozzles as required.		X
j)	Clean steel probes on rotamat screen		X

	Instruction	Daily	Weekly
3	Sludge Buffer & Blending Tanks “Sludge Blending Tank” refers to a tank, into which more than one type of sludge is fed, requiring mixing: normally immediately prior to sludge digestion or dewatering. It may on some sites be referred to as a sludge holding tank or digester feed tank.	Daily	Weekly
a)	Check that mixer is operating correctly. Mixers are normally inhibited if the sludge level falls below a set level to protect the impellor, pump or blower.	X	
b)	Check for signs of stratification or poor mixing and rectify where necessary	X	
c)	Check pH and if less than 5 attempt to reduce septicity and freshen sludge	X	
d)	Check for ragging and blockages and clear or remove (where safe access is possible)	X	
e)	Check amps on mixer motor		X
f)	Check tank control system		X
4	Sludge Treatment Inter Process Pumping	Daily	Weekly
a)	Check Ammeter reading, Too high could indicate a blockage. Too low could indicate an air lock or impeller damage. Where reading is unusual ensure appropriate action is taken.	X	
b)	Check flow rate (where meter is fitted); Is it within the normal operating range?	X	
c)	Check the well level is within the normal operating limits taking into account the flow conditions at the time. If level is too low or high, this could indicate control issues or pumping issues.	X	
d)	Check operation of the ultrasonic level gauge. Is it reading correctly? Compare the well level with the normal readout from the display.	X	
e)	Listen for undue pump noise and check for undue vibration by safely touching the lifting chain or guide rail.	X	
f)	Check pumps, pipelines and couplings for visible leaks	X	
g)	Check non-return valve is operating correctly Non return valves prevent water from flowing back through the pump when it is not in operation. If a weighted arm is fitted is it at the usual angle? If it is low and chattering it could indicate the pump is blocked.	X	

	Instruction	Daily	Weekly
5	Pasteurisation	Daily	Weekly
a)	Check batch rates according to sludge levels	X	
b)	Check digester temperatures in relation to pasteurisation plant	X	
c)	Check hmi panel	X	
d)	Check operation of biotherm reactor aeration blower package.	X	
e)	Check heat exchanger performance	X	
f)	Check digested sludge buffer tanks	X	
g)	Check blended sludge buffer tanks	X	
h)	Check operation of biotherm reactor mixer	X	
i)	Check operation of heat exchanger mixer	X	
j)	Check operation of scum cutter	X	
k)	Check pump and valve operation	X	
l)	Log and record flows, pressures and temperatures	X	
m)	Check % ds of feed sludge to pasteurisation plant (Monday, Wednesday, Friday)	X	
n)	Check, remove and clean temperature probe		X
6	Primary Sludge Digestion	Daily	Weekly
a)	Check sludge discharge to limpet chambers, where installed. Clear any blockages	X	
b)	Check digester feed system is working Clear any blockages	X	
c)	Check digester heating system is working & temperatures are within HACCP range.	X	
d)	Check digester mixing system is operating correctly	X	
e)	Log digester temperatures (HACCP) Log inlet and outlet temperatures of each boiler Log inlet and outlet temperatures of sludge and water in heat exchangers	X	
f)	Log sludge feed volumes into each digester and establish the retention time (HACCP)	X	
g)	Check operation of sludge and water recirculation pumps Check pumps, pipelines and couplings for leaks where possible.	X	
h)	Monitor water supply where glycol is not used to heat exchanges that are exposed to elements,	X	

	Instruction	Daily	Weekly
	Ensure water is drained when heat exchanges are not in use.		
i)	Log use of secondary fuel within boilers.	X	
j)	Sample sludge into and out of digester. Analyse and record % dry solids. (Monday, Wednesday, Friday.) Analyse and record % volatile matter. (3 times a week Monday – Thursday)	X	
k)	Check digesters for foaming on the top.		X
l)	Remove grit from base of digester if facility is provided. Do not leave grit removal operation unattended and ensure valve is fully closed before leaving task.		X
m)	Sample, measure and record pH of digested sludge		X
7	Secondary Sludge Digestion	Daily	Weekly
a)	Check mixing system, for short-circuiting or separation, Mix before transfer to the next process, where facilities exist	X	
b)	Decant supernatant liquor when required	X	
c)	Log status of each tank	X	
d)	Record number of day's storage	X	
8	Biogas Handling, Storage, & Utilisation.	Daily	Weekly
a)	Check all condensate traps manually and drain or top up if necessary. This check is required twice daily in prolonged periods of warm weather. Check automatic u-tubes visually, to ensure that there are no gas leaks or freezing Check automatic drain traps working correctly. Use manual drains if automatic drains not working, report defects	X	
b)	Check glycol pressure relief valve and ensure liquid level visible in sight glass	X	
c)	Check pressure/vacuum relief (whessoe) valves are not passing biogas. Listen for gas passing, note any unusual smell, visual check of valve.	X	
d)	Check for genuine operation of flare stack / waste gas burner, e.g. chp is at full power and there is excessive gas make	X	
e)	Check and record dehumidifier temperature	X	
f)	Log gas volumes: produced, flared, to chp, to boilers	X	
g)	Sample, monitor & record methane composition of biogas	X	
h)	Manually check gas isolation valve handle operation by closing &		X

	Instruction	Daily	Weekly
	opening valve.		
9	CHP & Biogas Power Management	Daily	Weekly
a)	Check automatic drain traps working correctly. Use manual drains if automatic drains not working, report defects	X	
b)	Check for genuine operation of flare stack / waste gas burner, e.g. CHP is at full power and there is excessive gas make	X	
c)	Check glycol pressure relief valve and ensure liquid level visible in sight glass	X	
d)	Check & log hours run	X	
e)	Check & log kwh exported (where relevant)	X	
f)	Check & log kwh generated	X	
g)	Check & log kwh used on site	X	
h)	Check & log use of secondary fuel	X	
i)	Check & log gas used	X	
j)	Check & log heat liberated from engine, heat dumped, heat liberated from boilers	X	
k)	Check & log engine temperatures and pressures, by exception	X	
l)	Check & log gas stream for methane composition		X
m)	Check automatic u-tubes to ensure that there are no gas leaks or freezing		X
n)	Check pressure/vacuum relief (whessoe) valves are not passing biogas. Listen for gas passing, note any unusual smell, visual check of valve.	X	
10	Liquor Treatment	Daily	Weekly
a)	Check return liquors and return rate	X	
11	Chemical Dosing	Daily	Weekly
a)	Check that chemical is discharging, not just dosing pump running (any nozzles blocked?)	X	
b)	Check chemical storage tank level - reorder as required	X	
c)	Check for excessive vibration in the dosing pump	X	
d)	Check the level in the internal bund and empty as required	X	
e)	Check for leaks on visible chemical lines	X	
f)	Check the trace heating system	X	
g)	Check external storage tank bund for rainwater and/or chemical.		X

	Instruction	Daily	Weekly
	Empty as appropriate.		
h)	Check the correct amount of chemical is being delivered for the conditions		X
i)	Check storage tank can take delivery before delivering		X
12	Sludge Dewatering – Belt Press	Daily	Weekly
a)	Check poly dosing system, Log polymer usage, note each bag change/delivery, Make adjustments to optimize	X	-
b)	Check sludge feed rate and log	X	
c)	Check sludge on the top belt and assess the conditioning of the sludge, Check belt drainage and filtrate quality	X	
d)	Check product quality & quantity, Check condition of stockpile	X	
e)	Visually check auto lubrication systems (grease pot) are functioning correctly, take appropriate action.	X	
f)	Ensure wash water pressure is available at a minimum of 6 bar	X	
g)	Clean belt steering paddles and check they are functioning correctly	X	
h)	Clean hopper level probes and check they are functioning correctly	X	
i)	Wash station - check formation of spraying fans, rotate internal brush to clean spray nozzles. (minimum twice daily)	X	
j)	Visual Check - Hydraulic power pack - check oil level top up using clean equipment and fresh oil as required, maintain as close to full level as possible. Oil level must not be allowed to fall below 3/4 as this will cause serious damage	X	
k)	Jet wash clean the belt filter.	X	
l)	Use low pressure water hose to clean complete machine, frame, rollers and hoppers.	X	
m)	Check condition of belt filter for blinding / blockages / good filtration	X	
n)	Steering flaps - check condition and correct operation for activation of the hydraulic steering mechanism and check for wear and replace as required	X	
o)	Sample, analyse & record % dry solids on feed and cake, (Monday, Wednesday, Friday)	X	
p)	High pressure steam clean the belt from underside.		X
q)	High pressure steam clean complete machine, frame rollers and hoppers avoiding all electrical and instrumentation equipment		X
r)	Check condition of belt filter for wear i.e. Creasing / condition of seam to avoid failure / breakage and damage to other components		X

	Instruction	Daily	Weekly
13	Sludge Dewatering – Centrifuge	Daily	Weekly
a)	Check condition of stockpile, Check quality of product	X	
b)	Check kwh, amps and hours run	X	
c)	Check poly dosing system	X	
d)	Check quality of centrate	X	
e)	Check sludge feed rate, Check quality of product in feed	X	
f)	Visually check auto lubrication systems (grease pot) are functioning correctly, take appropriate action.	X	
g)	Log hours run	X	
h)	Log kwh hours run	X	
i)	Log polymer usage, note each bag change/delivery	X	
j)	Log sludge flow rate	X	
k)	Log volume of cake produced	X	
l)	Make adjustments to get optimum throughput, product quality and poly dosing	X	
m)	Sample, analyse & record % dry solids on feed and cake (Monday, Wednesday, Friday)	X	
14	Poly Make Up, Storage, & Dosing – Liquid	Daily	Weekly
a)	Poly make up storage & dosing – liquid - check supply of polymer held in IBC; Top up, replace, order as appropriate	X	
b)	Liquid - check dosing pumps & settings	X	
c)	Liquid - check dilution water is available	X	
d)	Liquid - clean up any spillages of liquid	X	
e)	Liquid - log usage of polymer i.e. IBCs level	X	
f)	Liquid - log settings of dosing pumps	X	
g)	Liquid - log type of polymer	X	
h)	Liquid - check polymer flowmeter pressure – if above 3 bar clean filter and mixer		X
i)	Liquid - check made up solution appears ok	X	
j)	Liquid - check bunded area for spillages	X	
15	Poly Make Up, Storage, & Dosing – Powder	Daily	Weekly
a)	Dry powder - check dosing pumps & settings	X	

	Instruction	Daily	Weekly
b)	Dry powder - check supply of polymer held in silo; Top up, replace, order as appropriate	X	
c)	Dry powder - check banded area for spillages	X	
d)	Dry powder - check dilution water	X	
e)	Dry powder - check dry room / silo is heated, dry and doors are closed	X	
f)	Dry powder - check made up solution appears ok	X	
g)	Dry powder - check polymer is dry and flowing, look at screw drive and discharge to wetted head – “JETWET”	X	
h)	Dry powder - clean up any spillages	X	
i)	Dry powder - log settings of dosing pumps	X	
j)	Dry powder - log type of polymer, check using correct polymer.	X	
k)	Dry powder - log usage of polymer i.e. bags used	X	
l)	Dry powder - check polymer flowmeter pressure – if above 3 bar clean filter and mixer		X
16	Sludge Cake Transfer	Daily	Weekly
a)	Visually check auto lubrication systems (grease pot) are functioning correctly, take appropriate action.	X	
b)	Check conveyor rollers & keep clear	X	
c)	Check drive bearings for wear & operation	X	
d)	Check electric trip wire emergency stop wire	X	
e)	Keep general area clean. Clear up any spillages	X	
f)	Check belt condition	X	
17	Sludge Cake Storage	Daily	Weekly
a)	Ensure silo not filled above 70% capacity. Inform Bio-recycling of any changes to sludge production.	X	
b)	Keep general area clean to minimise odour	X	
c)	Log & record each storage pad bay activity and status if applicable	X	
d)	Check wheel wash is operational	X	

---- End of OMP ----