Asset Management
Asset Standard
Odour Management Plan

Hogsmill STW

HOGSS1ZZ

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0.2 Document Confidentiality

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0.3 Document Control

0.3.1 Document Change Request

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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
0	Creation of OMP	[redacted]		Aug 2006
1.0	Ensure in line with CoP guidelines			Nov 2006
1.1	Consideration of Odournet Report			Jan 2007
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1.3	Update			Sept 2009
1.5	Management Changes			Nov 2011
2.0	Conversion and validation of OMP into new Standard format			May 2014

Revision No	Reason for Revision	Prepared by	Approved by	Date
2.1	Review and update	[redacted]		February 2017
3.0	Growth project update			August 2018
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4.1	New Sludge Treatment Centre Permit Application			July 2022

0.4 Sign Off

Technical Lead	[redacted]	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	Performance 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 Hogsmill 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 Hogsmill 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 generation of odour from Hogsmill STW are identified, and how, as far as is reasonably practicable, they are controlled and recorded. It is primarily a management guide; detailed operational 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 2021 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, Site Drawings, and generic site and sludge rounds are included in Appendices 1-6.

2 Site Information

2.1 Location and Receptors

Site Address:

Hogsmill STW
Lower Marsh Lane
Kingston Upon Thames
Surrey
KT1 3BW
EPR Permit number to be included when issued

Hogsmill STW is located in Surbiton near the Hogsmill River (a tributary of the River Thames), about 2 km from the centre of Kingston Upon Thames. Hogsmill Nature Reserve and Surbiton Cemetery are to the south of the site while the Hogsmill River runs to the north of the site. There are recreation areas and green spaces to the west and east, which give way to predominantly residential properties with some light commercial properties to the West. A council Household Reuse and Recycling Centre can also be found to the west of the site. The STW serves a Population Equivalent of approximately 399,000. The works is located at the end of Lower Marsh Lane off Villiers Avenue.

Hogsmill STW catchment area encompasses New Malden, Worcester Park, Kingston, Surbiton, Chessington, Epsom and Ewell, Sutton, Banstead and Tadworth. The trunk sewers radiate out from the works in a North to South direction, and there is a principal sewer from the Worcester Park catchment that runs East to West. There are two storm tanks in the sewage network at Epsom and Ewell that are managed from the site, and feed into the Hogsmill valley sewer.

Receptors

The nearest receptors are given in Table 2.1 and have been marked on a site location map in Figure A of 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	Morrison Water Services	Commercial	Adjacent	South	Medium
2	Surbiton Cemetery	Cemetery	50	South	Medium
3	West side of Lower Marsh Lane	Residential / commercial	30-450	Southwest	High
4	Hogsmill Nature Reserve	Open space	30	South	Low

Receptor Number	Receptor Address	Receptor type	Approximate distance to the nearest site boundary (m)	Direction from the site.	Receptor Sensitivity
5	Berrylands train station	Transport	160	Southeast	Medium
6	Clayhill Halls of Residence	Residential	290	Southwest	High
7	Residential area surrounding Surbiton Hill Park	Residential	250	South	High
8	A3	Passing traffic	1500	Southeast	Low
9	Household Reuse and Recycling Centre	Industrial	60	West	Medium
10	Kingsmill Business Park	Commercial	260	West	Medium
11	Fairfield Industrial Estate	Industrial	260	Northwest	Medium
12	Kingstonian Football Club Ground & AFC Wimbledon	Recreational	70	North	High
13	Kingsmeadow Stadium	Recreational	160	North	High
14	Kingston Road Recreation Ground	Recreational	200	Northeast	High
15	Park Tennis in Kingston	Recreational	350	East	High
16	Kingston Cemetery and Crematorium	Cemetery	75	North	Medium
17	Area surrounding Kingston Road (A2043)	Residential / commercial / retail	320	North/ Northeast / East	High
18	Abbeyfield House	Care home - Residential	275	Southeast	High
19	King’s Oak Primary School	School	420	Northeast	High
20	Residential area surrounding Willow Road	Residential	230 - 680	East	High
21	Kingspark Business Centre	Commercial	640	East	Medium
22	Rose Walk Nature Reserve & Green	Open space	320	Southeast	Low

Receptor Number	Receptor Address	Receptor type	Approximate distance to the nearest site boundary (m)	Direction from the site.	Receptor Sensitivity
	Lane Recreation Ground				
23	Green Lane Nursery	Nursery	790	Southeast	High
24	Residential area surrounding South Lane	Residential	850 - 1600	Southeast	High
25	King's College London New Malden Sports Ground & LSE Sportsground	Recreational	900	Southeast	High
26	Supreme Bowling Club	Recreational	1500	Southeast	High
27	New Malden	Residential	230 - 2000	East / Southeast / Northeast	High
28	New Malden train station	Transport	1800	East	Medium
29	Area surrounding the B283	Residential / Retail / Pubs & Restaurants	1800	East	High
30	The Malden Centre	Recreational	2000	East	High
31	New Malden United Reformed Church	Church	1900	Southeast	High
32	Corpus Christi Roman Catholic Primary School	School	750	Northeast	High
33	Dickerage Lane Adventure Playground	Recreational	700	Northeast	High
34	Christ Church New Malden Church of England Primary School & Christ Church New Malden CoE Primary School Junior Site	School	1500 & 1000	Northeast	High
35	Malden Wanderers Cricket & Lawn Tennis Club	Recreational	1900	Northeast	High
36	Malden Golf Club	Recreational	1800	Northeast	High

Receptor Number	Receptor Address	Receptor type	Approximate distance to the nearest site boundary (m)	Direction from the site.	Receptor Sensitivity
37	Coombe Girls' School	School	1500	Northeast	High
38	The Bull and Bush Hotel Kingston	Hotel	600	North	High
39	Residential area surrounding Willingham Way	Residential	370	North	High
40	Residential area surrounding Douglas Road	Residential	400	North	High
41	ViBe Student Living	Residential	620	North	High
42	Tiffin School	School	1000	Northwest	High
43	Norbiton	Residential	1000	North	High
44	Norbiton train station	Transport	1000	North	Medium
45	Kingston Hospital	Hospital	1200	North	High
46	Coombe Wood Golf Club	Recreational	1400 - 2000	North	High
47	Alexandra School & St Paul's CofE Primary School, Kingston Hill	Schools	1550	North	High
48	Residential area surrounding Acre Road	Residential	1600	North	High
49	Kingston Muslim Association	Mosque	1600	Northwest	High
50	The Bentall Centre & surrounding area	Retail / Restaurants	1500	Northwest	High
51	Rotunda – Leisure Centre & surrounding area	Recreational / Retail / Restaurants	1200	Northwest	High
52	Kingston Museum	Recreational	1150	Northwest	High
53	Kingston University Penrhyn Road Campus	University	1000	West	High
54	Rose Theatre	Recreational	1500	Northwest	High
55	Kingston Grammar School	School	900	Northwest	High
56	Fairfield Park	Open Space	760	Northwest	Low

Receptor Number	Receptor Address	Receptor type	Approximate distance to the nearest site boundary (m)	Direction from the site.	Receptor Sensitivity
57	Kingston Bridge	Passing traffic	1700	Northwest	Low
58	Kingston train station	Transport	1400	Northwest	Medium
59	DoubleTree by Hilton Hotel London	Hotel	1700	Northwest	High
60	Kingston Riverside Club	Recreational	2000	Northwest	High
61	Residential area surrounding Surbiton Road	Residential	900	West	High
62	Kingston-upon-Thames Crown Court	Courthouse	1200	West	High
63	Residential area surrounding Grove Lane	Residential	500	West	High
64	Surbiton High School	School	1100	Southwest	High
65	Surbiton	Residential	300 - 2000	Southwest	High
66	Seething Wells	Residential	2000	Southwest	High
67	Surbiton train station	Transport	1500	Southwest	Medium
68	Glenmore House	Recreational	1350	Southwest	High
69	Hollyfield School	School	920	Southwest	High
70	Area surrounding B3370	Residential / Retail / Pubs & Restaurants	1000 – 1800	Southwest	High
71	Surbiton Racket & Fitness Club	Recreational	800	South	High
72	Christ church c of e primary school	School	900	South	High
73	Berrylands	Residential	1000	South	High
74	Alexandra Recreation Ground / Alexandra Park	Open Space	1550 - 1900	South	Low
75	Grand Avenue Primary School	School	1200	Southeast	High
76	Hogsmill Public Open Space /	Open Space	600	Southeast	Low

Receptor Number	Receptor Address	Receptor type	Approximate distance to the nearest site boundary (m)	Direction from the site.	Receptor Sensitivity
	Berrylands Nature Reserve & Park				
77	Residential area surrounding Ewell Road	Residential / Retail / Pubs & Restaurants	1100 – 2000	South	High

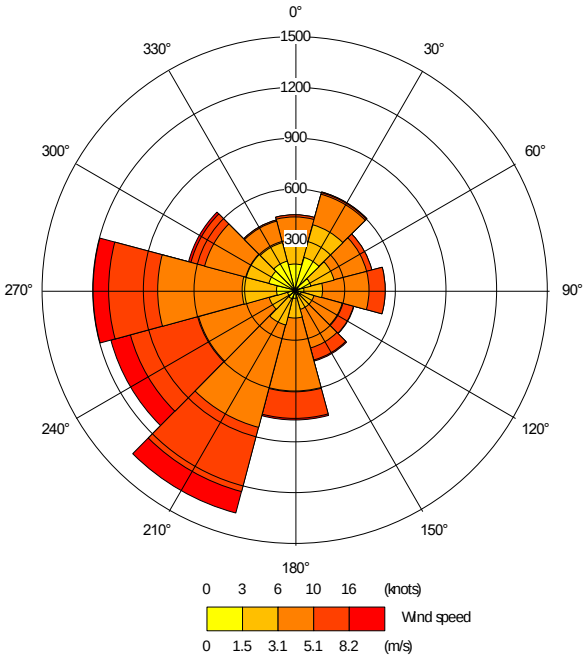
2.2 Off-site sources of odour

There is a Household Reuse and Recycling Centre on Chapel Mill Road to the northwest which has the potential to generate odour.

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 westerly. The data is taken from Heathrow Airport meteorological station, approximate location NGR E 506952 N 176574. Data is recorded in hourly measurements and the information covers the year 2019.

Figure 2.31: Heathrow Wind Rose, 2019



There is no on-site weather station at Hogsmill. 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

The following sections describe the processes of wastewater and sludge treatment and should be read in conjunction with the site plan and process flow diagram given in Figures B and D in Appendix 4.

2.5.1 UWWTD activities.

Hogsmill Sewage Treatment Works (STW) primarily treats sewage of a domestic origin, although some industrial releases are also received.

Sewage is conveyed to the works via the Hogsmill sewer and Worcester Park tunnel to covered chambers from which sewage is pumped into a covered elevated inlet reception chamber. The flow is then screened and gravitates via covered channels through a pair of detritors before it is distributed to five Primary Settlement Tanks. Prior to distribution to primary treatment assets, ferric chloride is added for enhanced primary tank performance and for Hydrogen Sulphide control in the biogas. Screenings material from the screens is passed to four combi washers and then deposited into open skips prior to removal from the site for disposal. Dedicated screens are provided for stormwater flows passing to the storm tanks also served by dedicated screenings conditioning plant and screenings skips. The grit skip, main inlet screenings skips and the inlet works are fitted with covers and odorous air is extracted to an odour control system.

Under storm conditions, flows in excess of the treatment capacity of the works are directed to eight rectangular storm tanks, via a hydraulic pen stock.. There are two inclined storm screens prior which discharge to the storm tanks. Storm tank discharge is screened via two drum screens and combines with the final effluent line. These tanks are also fitted with two mixing pumps each, which aim to keep any solid material in suspension so that it can be returned back to the works when storm conditions subside.

There are five Primary Settlement Tanks (PSTs) in operation at Hogsmill STW. The tanks are fed with iron dosed sewage by a common distribution chamber and each tank is fitted with scum traps (which discharge to two scum collection chambers) and a sealed desludge system. It is understood that the tanks are operated with a minimal sludge blanket, using an automated desludging regime.

Following primary settlement, the settled sewage is mixed with Return Activated Sludge (RAS), and then distributed to the activated sludge Biological Nutrient Removal (BNR) plant. Each of the six lanes of this plant is divided into anaerobic, anoxic and aerobic stages. Under the current operational regime, Poly Aluminium Chloride (PAC) is dosed into the plant via the RAS to control the formation of filamentous organisms and to remove phosphorus, (along with the initial Ferric dose), to meet the Urban Waste Water Treatment Directive requirements.

Following treatment, the flow goes to distribution chambers which feed eight Final Settlement Tanks (FSTs). Following settlement, a proportion of the FST effluent undergoes tertiary treatment in sand filters. The final effluent is split between two water courses, the Hogsmill River that receives the majority of the flow and the Beverly Brook which receives a smaller pumped compensation flow.

2.5.2 Sludge Treatment Centre Permit Activities

Hogsmill STC does not have an offloading point for imported wastes at the works inlet. The only imports accepted at the works relate to imports directly to the digesters. While there are no routine imports of sludge to Hogsmill STW, this aspect is included within the variation application for future operational flexibility and resiliency of Hogsmill STW within the wider TWUL area.

Incoming sewer derived wastewater passes via the primary settlement tanks where the sludge is removed and transferred via three screens that remove rags and inorganic material which is discarded into a skip, and into one of three picket fence thickeners (PFT). Thickened raw sludge from the picket fence thickeners is then pumped to the two sludge blending tanks, where it is mixed with thickened Surplus Activated Sludge (SAS) originating from the final settlement tanks.

SAS is pumped from the final settlement tanks to the SAS tank. The SAS tank is an uncovered steel tank with a volume of 166 m3 and sludge thickened using SAS belt thickeners within the dewatering house, with the addition of a liquid polymer to aid coagulation. Once thickened, SAS is pumped to sludge blending tank no.1.

The picket fence thickeners and sludge blending tanks are enclosed tanks constructed from glass lined steel and are connected to an odour control unit (OCU). The sludge blending tanks, one with a volume of 125 m3 and one with a volume of 197 m3 , are hydraulically linked, with a subsurface pipe between the two tanks balancing the volumes between both tanks, although both tanks can be isolated or bypassed as required. Under normal operating conditions, raw sludge and SAS is mixed within sludge blending tank no.1.

Sludge from the blending tanks is then pumped via dedicated digester feed pumps to one of the four primary anaerobic digester tanks on site. Three of these digester tanks are of concrete construction with an insulated external steel cladding and have a volume of 3,607 m3 each. The fourth digester tank is of concrete construction with an insulated external steel cladding and has a volume of 3,551 m3 . The four digester tanks operate on a ‘fill and spill’ basis, with small batches of sludge being introduced on a regular basis into the top of the digester through a heating circuit, which is used to maintain the digester temperature. Cooler sludge is extracted from near the bottom of each digester tank and mixed with the incoming sludge from the blending tank and the heating circuit. Anti-foam is injected via the heating circuit, when required, and regular visual checks take place on the sludge lines and digester tanks. After a normal retention time of 15-18 days, digested sludge weirs via a limpet chamber and into a common subsurface sludge line to a wet well (‘Thrupenny bit chamber’ / ‘HEX Chamber’) and the secondary digester tanks.

The site has three secondary digester tanks and two emergency storage tanks. Under normal conditions, digested sludge gravitates from the ‘Thrupenny Bit Chamber’/’Hex Chamber’ wet well into

secondary digester tank no. 1, cascades from secondary digester tank no.1 into secondary digester tank no. 2 before gravitating to the digester return well and being pumped to secondary digester tank no.3. Retention time within the secondary digester tanks no.1 and no.2 is normally six days, each with a volume of 2,175 m3 . Secondary digester tanks no.1 and no.2 are both located within the central area of the wider sewage treatment works while secondary digester tank no.3 is located between the primary digester tanks and the digested sludge cake pad. Secondary digester tanks no.1 and no.2 are subsurface, concrete tanks, conical bottomed, fitted with two, double membrane gas holders (Dual Biodome) separated by a bridge spanning the diameter of the tank. The gas holder sits on a bed of sludge, as there is no head room above the sludge, with the collected biogas transferring along a common biogas line to one of the two gas holders on site.

If required, due to inhibiting of flow out of the secondary digester tanks or high levels in the 'Thrupenny Bit Chamber'/'Hex Chamber' wet well, digested sludge from the primary digesters can be diverted from the 'Thrupenny Bit Chamber'/'Hex Chamber' and into emergency storage tank no.1 and then emergency storage tank no.2. The emergency storage tanks can both store a maximum of 2,175 m3 of sludge. Following temporary storage, the digested sludge is manually pumped out of the emergency storage tanks and back to the wet well. Both emergency storage tanks are of open topped, concrete design and largely subsurface. They are not connected to any odour control as this area of the site does not normally give rise to odours.

From the sludge well, feed pumps transfer the digested sludge to secondary digester tank no.3, which acts as a holding tank for digested sludge dewatering. The digested sludge is pumped through an inline macerator and into the top of secondary digester tank no.3. This tank is of concrete construction, has a flat bottom with gas mixing and is mostly above ground, with a capacity of 2,222 m3 . Transfer pumps then pump this digested sludge to the digested sludge dewatering buffer tank which is located outside of the dewatering building. The digested sludge dewatering buffer tank is an uncovered, round, above ground tank of steel construction with a capacity of 29 m3 and transfers the digested sludge to one of three beltpresses for dewatering. Each press has its own dedicated transfer pump and transfer line, with the beltpresses dewatering digested sludge with the addition of a liquid polymer from an IBC, to aid coagulation.

Dewatered digested sludge is then transferred via a conveyor to the adjacent cake pad and the belt press liquor (filtrate) is collected in a wet chamber outside of the dewatering building and returned through the site drainage system to the onsite Tunnel Pumping Station, where it combines with incoming urban waste waters and is pumped up into the works inlet to pass through the aerobic treatment processes. The cake pad is a large, open area of engineered hardstanding with four separate bays for digested sludge cake storage. Digested sludge cake is then removed from the site under the Sludge Use in Agriculture Regulations 1989 (SUiAR), and in accordance with the Biosolids Assurance Scheme (BAS). Any non-compliant digested sludge cake is stored within one of the four bays for an extended duration of time to mature, with the bay marked by a 'NC' sign to indicate it is non-compliant and prevent its removal from site. Drainage from the cake bays gravitate from the bays towards the cake pad wall where it enters drainage channels and is returned to the works inlet via a wet chamber shared with the dewatering building and the onsite Tunnel Pumping Station.

Biogas from the primary digesters and secondary digesters is captured and transferred to two double membrane gas holders for storage, which have a total storage volume of 2,800 m3 . The biogas transfer pipeline is equipped with condensate pots that capture entrained moisture from the generated biogas and allow it to be drained into wet wells which enter the site drainage system and enable treatment through the UWWTD system. Biogas can be used in the site CHP engines, boilers and emergency flare, with biogas automatically diverted to an emergency flare in the event of high pressures or capacity.

Biogas is taken from the gas holders for combustion in one of the three CHP engines on site. They generate electricity for use on site and heat to maintain primary digester temperatures, via lagged and insulated pipework. This is classified as ‘existing’ combustion plant under the Medium Combustion Plant Directive and permitted by the existing CHP Plant and Standby Diesel Generators Environmental Permit (EPR/LP3138LP). In the event of additional heating being required for the primary digesters, biogas may be used in the onsite auxiliary boilers to provide heat to the digesters. There are three dual fuelled boilers which can operate on both biogas predominantly and diesel (if necessary).

In the event of excess biogas, due to CHP engine or boilers being unavailable or there being more biogas than the CHP engines or boilers can utilise, there is a ground mounted emergency flare. This is utilised under 10% of the year, less than 876 hours per year and its use is recorded. The site has a number of tanks for the storage of diesel fuel, which are compliant with Oil Storage Regulations.

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

3 Site Management Responsibilities and Procedures

3.1 Site Roles

Figure 3.1 - Site Roles

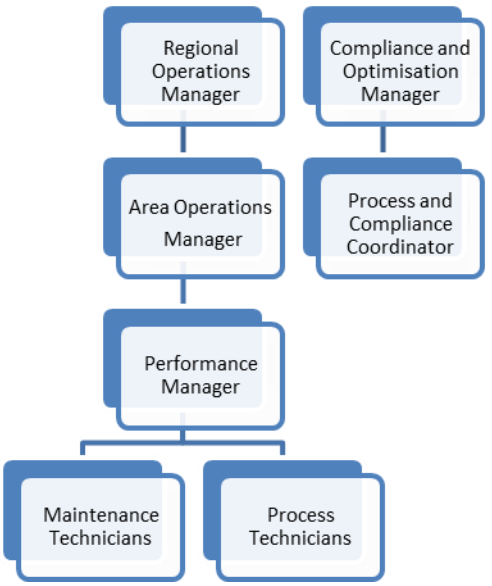


Table 3.1 - Tasks and Responsibilities

Role	Tasks and Responsibilities
Area Operations Manager	Responsible for overall performance of the STW in the area, including assessing the scope of, and updating the OMP as it is implemented.
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 • 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. • day-to-day operation of the STW • Ensuring staff Thames Water staff undergo appropriate training
Technically Competent Manager	Hold the required WAMITAB qualification to support the activities on site under EPR, ensuring permit conditions are complied with.
Maintenance and Process Technicians	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.

Role	Tasks and Responsibilities
Compliance and Optimisation Manager	Responsible for process investigations and technical assistance.
Process Compliance Coordinator	Reports to Compliance and 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 operates 24 hours a day and is manned Monday to Friday from 7:30 am to 3:30 pm, Saturday and Sunday 7:30 am to 12:30pm.

Hogsmill STW is controlled and operated remotely from a Control Centre at Beddington STW and by a day works team at Hogsmill STW.

3.2 Key Contacts

Role	Name	Email address	Phone Number
Area Operations Manager	[redacted]		
Performance Manager			
Technically Competent Manager			
Customer & Stakeholder Manager			
Customer Centre			

3.3 Operator Training

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.

All Technicians/operators have received or are working towards training appropriate to their grade and, in the Wastewater Operating Process NVQ Level 2 or QCF Level 2 Diploma in Operating Process Plant (Sludge Treatment) and Level 2 Extended Diploma in Operating Process Plant (Waste Water

Treatment), an element of training and assessment in the control of odour. All records of staff training are held on the company HR training database in SAP.

4 Odour Critical Plant Operation, Monitoring and Management Procedures

4.1 Odour Sources, Critical Issues and History

Hogsmill STW has some history of odour complaints. 24 complaints were received in 2018, 12 received in 2019, 12 in 2020, 11 in 2021 and 3 in 2022 (YTD).

An Odour Risk Assessment is included as Appendix 1.

An Odour Improvement Plan is included 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

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

- General Odour
- Site Drainage
- Tunnel Pumping Station
- Hogsmill Pumping Station
- High level reception channel
- Storm split
- Storm tanks – feed channel
- Storm tanks
- Drum screen
- Drum screen – skips
- Screening
- Screening Handing – Megawashers
- Screening Handling – Skips
- Grit Removal Equipment - Detritor
- Grit skips
- Flow & Distribution to Primary Settlement Tanks
- Primary Settlement Tanks
- Fats, Oil & Grease Scum removal system
- Primary Raw Desludge pumping
- Flow & Distribution to Secondary Treatment
- Activated Sludge Plant Lanes & Zones
- Flow & Distribution to Secondary Settlement
- Final Settlement Tanks
- Scum Removal System
- RAS/SAS Chambers & Pumping
- Disc Filters
- Hogsmill A - River Hogsmill
- OCU Inlet Works

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

- Primary raw sludge screening - Strain press
- Primary raw sludge - Screenings skip
- Picket Fence Thickeners
- SAS Thickening - Dewatering building
- Sludge Blending & Mixing
- Primary Digestion
- Secondary Digestion and Mixing - Tanks 1 & 2
- Wet Well (Thrupenny Bit Chamber)
- Secondary Digestion and Mixing - Tank 3
- Secondary Digestion and Mixing - Emergency storage tanks
- Digested Sludge Dewatering Buffer Tank
- Belt presses
- Cake Pad & Drainage
- Vehicle Movements
- Biogas Storage - Gas bag
- CHP
- Boilers
- Waste Gas Burner - Flare stack gas

- Standby Generators
- OCU - PFT & Sludge Blending Tanks

4.2.3 Odour Critical Plant

The following list of odour critical plant has been identified during the Odour Risk Assessment:-

- Storm tanks – Feed Channel
- Storm Tanks (& cleaning system)
- Screening Handling – Skip
- Primary raw sludge - Screenings skip
- Primary Raw Sludge Thickening – PFTs
- Sludge Blending & Mixing
- Primary Digestion
- Cake Pad & Drainage
- Biogas Storage - Gas bag
- Waste Gas Burner - Flare stack

4.2.3 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)
Picket Fence Thickeners	3	1668	Glass lined steel	4.2 days
Sludge Blending Tanks	1	125	Glass lined steel	0.5 days
	1	197	Glass lined steel	
SAS Tank	1	166	Steel	0.2 days
Primary Digester	3	3,607	Concrete, external steel cladding	15 – 18 days
	1	3,551	Concrete, external steel cladding	
Secondary Digester	2 (no.1 and no.2)	2,175	Concrete	6 days
	1	2,222	Concrete	3 days
Emergency Storage Tanks	2	2,175	Concrete	7 days
Thruppenny Bit / HEX Chamber	1	83	Concrete	0.14 days

Digested Sludge Dewatering Buffer Tank	1	29	Steel	0.25 days

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	3500	75 days	Cake Pad
Biogas	N/A	Low	Gas holder capacity is 2,800m^3	Continuous operation	Point A13 and A14 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 chamber, and Tunnel Pumping Station
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	PFTs and Sludge Blending Tanks
Raw imported sludge (Not currently in use)	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	Imports are directly to the digesters
Thickened sludge import (Not currently in use)	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	Imports are directly to the digesters
Surplus Activated Sludge	19 08 05	Medium/High	Refer to Table 4.0 Site Tank Inventory	Retention times for each stage of the process	SAS Tank, SAS Dewatering Plant and Sludge Blending Tanks

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
				are detailed in Table 4.0	
Raw Sludge screenings	19 08 01	Low / Medium	1	Skips emptied within 24 of being full	Before the PFTs

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

PFT & Sludge Blending – Odour Control Unit

Gas from the PFTs (1, 2 and 3) and the Sludge Blending Tanks (1 and 2) are treated through Biofilters for odour control. The odour units consist of two biofilters and two activated carbon units operating in series with 2 no. duty/standby extraction fans. Treated air from the OCU is discharged to atmosphere via the stack. A screened final effluent irrigation system ensures the biofilter media is kept moist and to control pH in the media bed. Bypass of each treatment stage is available to allow for partial treatment during media replacement.

The CMI Europe Environment supplied OCU was constructed in 2018 and consists of two biofilters and two activated carbon adsorbers. The biofilter media is Pouzzolane and the carbon media - EE-AC 4 KOH MAX*. Media volumes are Biofilter 57500 kg and carbon - 2400 kg respectively.

Inlet Works – Odour Control Unit

Odour from Hogsmill PS, Tunnel Pumping Station and the inlet (inlet distribution Chamber, inlet Channels, the Screens area channels and the Detritors) is extracted and processed through an Odour Control Unit consisting of a Catalytic Iron Filter (CIF) unit followed by two carbon filters in parallel with 2 no. direct drive duty/standby fans post carbon filter.

The carbon media is OSIL CuCarb. Media volumes are Biofilter 5 m3 and carbon 17 m3 (8.5 m3 each carbon unit). The design capacity is 15000 m3/hr @ 3500 pa. Hogsmill PS inlet: 6642 m3/hr, Tunnel PS: 7140 m3/hr Total 13782 m3/hr.

Hydrogen Sulphide levels of the OCUs are measured from the exhausts and recorded on the SCADA system.

OCUs are checked by the Tech 1s as per the site round checks. A check sheet is used to record parameters to ensure OCUs are operating within limits as per schedule of operational tasks.

4.3.2 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 Hogsmill STW are summarised in the tables below.

The routine operational tasks carried out at Hogsmill 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 Offensiveness L/M/H	Specific Odour Management Tasks	Responsibility	Monitoring	Monitoring Frequency
General		Housekeeping – keep site clean and tidy.	Site Tech 1s	Visual Inspection	Daily
		H&S "stand downs are carried out to address areas of the site and recorded on SpheraCloud.	Operational teams and Maintenance	Visual Inspection	Every 2 months
Site drainage	Diluted septic (M)	The drains are checked and cleared as required to enable effective wash down of odorous material.	Site Tech 1s	Visual Inspection	As required
Tunnel Pumping Station & Hogsmill Pumping Station	Sewage (L)	Air is extracted and processed through an Odour Control Unit. Covered.	Tech 1	SCADA	Continuous
High level reception channel & Storm Split	Sewage/Musty (L)	Covered and Odour controlled	Tech 1	SCADA	Continuous
Storm Tanks - Feed channel	Crude sewage (L)	Enclosed pipework	Tech 1	Visual Inspection	Daily
Storm tanks	Sewage/septic (M)	Tanks are checked to make sure that they have been correctly emptied. If not they are emptied and flushed. The jet mixing system is used together with a trialled manual flushing arrangement using a water cannon on a proportion of the tanks. Temporary odour reduction by sprays can be used if unable to return storm tank contents	Site Tech 1s	Visual Inspection	Daily
Drum Screen	Sewage (M)	The screens are regularly cleaned internally and externally to prevent blockage.	Site Tech 1s	Visual Inspection	Daily

Drum screen - skips	Sewage (L)	The area is regularly hosed down to minimise odours from skip draining and spills.	Site Tech 1s	Visual Inspection	Daily
Screening	Sewage (L)	Covered. Air is extracted and processed through an Odour Control Unit. The screens are regularly cleaned internally and externally to prevent blockage.	Site Tech 1s	Visual Inspection / SCADA	Daily / Continuous
Screening Handling - Megawashers	Sewage (L)	Enclosed	Site Tech 1s	Visual Inspection	Daily
Screening Handling - Skips	Sewage / rag (M)	Quality of screenings has improved due to replacement with megawashers. The area is regularly hosed down to minimise odours from skip draining and spills. During the skip changes the area is washed down and all screenings are removed.	Site Tech 1s	Visual Inspection	Daily
Grit Removal Equipment - Detritor	Sewage (L)	Covered. Inlet baffles are cleaned daily to remove rag and collected and put into skips.	Site Tech 1s	Visual Inspection	Daily
Grit Skips	Sewage / grit (M)	Ensure contractors collect skips promptly and Tech 1s manage build up and spills.	Site Tech 1s	Visual Inspection	Daily
Primary Settlement Tanks	Sewage (L)	The sludge blanket levels are monitored and controlled to a target normal operating level of 0 metres.	Site Tech 1s / PM	Manually Dipped - Visual Inspection	Daily
Flow and Distribution to Primary Settlement Tanks	Sewage/Septic (H)	Covered	Site Tech 1s	Visual Inspection	Daily
Fats, Oil & Grease Scum Removal System	Sewage / Fat / rag (M)	Clear any blockage ASAP	Site Tech 1s	Visual Inspection	Daily

Primary Raw Desludge Pumping	Sewage (H)	Enclosed	Site Tech 1s	Visual Inspection	Daily
Flow & Distribution to Secondary Treatment	Activated sludge (L)	Prevent filamentous build up on aeration surface. Maintain surface sprinklers removing weed growth.	Site Tech 1s	Visual Inspection	Daily
Activated Sludge Plant Lanes & Zones	Earthy (L)	The spray system is regularly checked.	Site Tech 1s	Visual Inspection	Daily
Flow & Distribution to Secondary Settlement	Activated sludge (L)	Monitor for filamentous build up on aeration and distribution lane surfaces.	Site Tech 1s	Visual Inspection	Daily
Final Settlement Tanks	Final Effluent (L)	Monitor for filamentous build up on tank surfaces.	Site Tech 1s	Visual Inspection	Daily
Scum Removal System	Final Effluent (L)	Monitor condition for fat and rag build up	Site Tech 1s	Visual Inspection	Daily
RAS/SAS Chambers & Pumping	Activated sludge (L)	Check SCADA for pump performance	Site Tech 1s	SCADA	Daily
Disc filters	Final Effluent (L)	Tech 1 monitoring / sampling	Site Tech 1s	Visual Inspection / sampling	Daily & Weekly

Hogsmill A - River Hogsmill	Earthy (L)	Manual intervention - e.g changing flow rates	Site Tech 1s / PM	Visual Inspection	As required
OCU - Inlet Works	Residual odours (L) and Earthly odours (L)	Hydrogen Sulphide levels are measured from the exhaust.	SCADA system	Automated	Continuous
		OCUs are checked as per site rounds and a check sheet used to record the results as per schedule of operational tasks.	Site Tech 1s	Follow check list	Daily / Weekly
		Inspected and performance measured by an expert third party framework maintenance service provider followed by proactive intervention on any faults or defects.	Contractor	As described in section 5	Monthly

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

Odour Source	Odour Offensiveness L/M/H	Specific Odour Management Tasks	Responsibility	Monitoring	Monitoring Frequency
Primary raw sludge screening - Strain press	Primary sludge (H)	Machinery is enclosed. General housekeeping. Clean up spills ASAP.	Site Tech 1s	Visual Inspection	Daily
Primary raw sludge - Screenings skip	Primary sludge (H)	Ensure full skips collected by contractor when required	Site Tech 1s	Visual Inspection	Daily
Picket Fence Thickeners	Primary Sludge (H)	Air is extracted and processed through an Odour Control Unit	Site Tech 1s	SCADA	Continuous
		Covered. All hatches are kept closed and covers are in place and sealed.	Site Tech 1s	Visual Inspection	Daily

SAS Thickening - Dewatering building	Sulphur compounds, Earthy (L)	Keep the doors of the dewatering building closed unless an operational necessity for asset maintenance.	Site Tech 1s	Visual Inspection	Daily
Sludge Blending Tank	Primary sludge (H)	Air is extracted and processed through an Odour Control Unit	Site Tech 1s	SCADA	Continuous
		Hatches are to be kept closed. Tanks were replaced / constructed in 2019.	Site Tech 1s	Visual Inspection	Daily
		Waste storage time is minimised prior to digestion and untreated sludge is only stored within closed tanks and vessels	Site Tech 1s	Visual Inspection	Daily
Primary Digestion	Digested sludge (M)	Tanks are covered. General housekeeping.	Site Tech 1s	Visual Inspection	Daily
Secondary Digestion and Mixing - Tanks 1 & 2	Digested sludge (M)	Enclosed	Site Tech 1s	Visual Inspection	Daily
Wet Well (Thrupenny bit Chamber)	Digested sludge (L)	None - uncovered but small surface area	N/A	N/A	N/A
Secondary Digestion and Mixing - Tank 3	Digested sludge (M)	Covered (completed in 2019) and now part of a digestion gas system	Site Tech 1s	Visual Inspection	Daily
Secondary Digestion and Mixing - Emergency storage tanks	Digested sludge (L)	Not generally in use - used only in case of an emergency (eg failure of dewatering plant). Plant which impacts storage replaced in 2019.	Site Tech 1s	Visual Inspection	As required

Digested Sludge Dewatering Buffer Tank	Digested sludge (M)	Continuous throughput	Site Tech 1s	Visual Inspection	Daily
Belt presses	Digested sludge (M)	In a building. Washdown facility - used daily.	Site Tech 1s	Visual Inspection	Daily
Liquor Return	None	Under the ground	N/A	Continuous	Continuous
Cake Pad	Digested sludge cake (M)	Communication with bio-recycling team - informed of cake build up. Install temporary odour masking measures if required.	TW Biorecycling / PM	Visual Inspection	Daily
Vehicle Movements	Digested sludge cake (M)	The vehicles are covered	TW Biorecycling	Visual Inspection	Daily
Biogas Storage - Gas bag	Biogas (H)	Regular statutory checks are made on the primary and secondary digester whessoe valves and other pressure relief devices with a report provided.	Site Tech 1s / Contractor	Visual Inspection	Daily / 6 Monthly contractor visits
CHP	Combusted biogas (L)	Planned preventative maintenance	CHP Team	As per site & sludge rounds in Appendix 5 & 6	Daily & Weekly
Boilers	Combusted biogas (L)	Planned preventative maintenance	Contractor	As per site & sludge rounds in Appendix 5 & 6	Daily & Weekly
Waste Gas Burner - Flare stack gas	Combusted biogas (L)	The flare stack is maintained under a service contract with the supplier with a report provided.	Contractor	As described	6 Monthly contractor visits
Standby Generators	None	Only in use when test run and power failure, TRIAD events. Air emissions monitoring carried out in line with permit conditions. Planned preventative maintenance.	TW Ops and Contractor	Monitored as per the permit conditions	Either every 150 hours or every 5 years
		Hydrogen Sulphide levels are measured from the exhaust.	SCADA system	Automated	Continuous

OCU - PFT & Sludge Blending Tanks	Residual odours (L) and Earthly odours (L)	OCUs are checked as per the site checks and a check sheet used to record the results as per schedule of operational tasks.	Site Tech 1s	Follow check list	Daily / Weekly
		Inspected and performance measured by an expert third party framework maintenance service provider followed by proactive intervention on any faults or defects.	Contractor	As described in SOM	Monthly

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

Process stage	Event	Status (frequent/ rare/planned)	Ops mitigation	Odour risk after mitigation
Tunnel Pumping Station	Cleaning (fat / rag build up)	P	The pumps have the ability to snore down in order to clear the debris and fat	Low
Hogsmill Pumping Station	Cleaning	P	Covers only removed during cleaning activity and replaced at the end of each working day.	Low
Storm Tanks - Feed channel	Storm event	F	Clean ASAP	Low
Storm Tanks	Operation in hot weather	R	Thorough clean after event	High
	Emptying / Cleaning	P	Pump mixing system and water canon / enter tank with hose.	Medium
	Unable to return storm tank contents	R	Priority activity with contractor to clear. Consider temporary odour reduction by sprays if long term.	Medium
	Failure of cleaning system	R	Call contractors to clean the tanks or in house labour	Low
Drum Screen	Failure	R	Sewage by-pass. Find cause and resolve ASAP	Low
Drum Screen Skips	Drum screen skips not collected.	R	Cover skips and contact contractor.	Low
Screening	Screen open for maintenance	P	Clean ASAP	Low
	Blockage	R	Clear ASAP	Low

Screening Handling - Washpactors	Maintenance	P	The covers of the Washpactor are kept closed. Clean down ASAP.	Low
Screening Handling - Skips	Spillages	F	Clean up and hose down	Low
Grit Removal Equipment - Detritor	Detritor failure	R	Any failure is investigated immediately for the cause and resolved.	Low
	Cleaning for maintenance	P	If the detritor is out of action, such as under maintenance, the plant is washed out after being drained down in order to minimise odour.	Medium
Grit skips	Skips not collected by contractor	R	Cover skips and chase contractors or empty into alternative skips.	Medium
Ferric Dosing	Leakage	R	Clean up spills ASAP. Find cause of leakage and resolve.	Low
Primary Settlement Tanks	Scrapers fail	R	The scrapers are checked by Site Tech 1s to ensure in working order. Drain tank to check scrapers.	Low
	Build-up of scum or rag on tank surface	R	Removed ASAP. Fat traps jetted to remove rag and fat or tank taken out of service for inspection and clean.	Low
	High blanket level	R	Find cause and resolve (potential blockage), ultimately take tank out of service and clean.	Low
	Tank drained down	P	The tanks are washed out as soon as practicable after being decommissioned and drained	Low
Fats, Oil & Grease Scum Removal System	Blockage	R	Cleared ASAP	Medium
Primary Raw Desludge Pumping	Failure / blockage due to high blanket level in PSTs	R	Open the drain valve and drain sludge manually	Low
	Spillages	R	Clean up ASAP	Low
Aeration Lanes	Failure of effluent spray system during hot weather.	R	Investigate cause and resolve it	Low
	Excess ASP foaming	R	Hose the lane down. Address route cause of foaming.	Low
Final Settlement Tanks	Tank drained down	P	Hose tank down	Low

Scum Removal System	Failure of Scum Removal System	R	Investigate cause and resolve it.	Low
RAS/SAS Chambers & Pumping	Failure of pumps for RAS/SAS	R	Use spare pumps if available	Low
Disc filters	Unit drained down	P	Wash down	Low
Hogsmill A - River Hogsmill	Discharging from storm tanks	R	Ensuring full flow to treatment	Low
OCU - Inlet Works	Failure	R	Hydrogen Sulphide levels are measured from the exhaust on SCADA. Media replacement through capital funding if media failure. Monitor remotely.	Low
OCU - Inlet Works	Maintenance	P	Consult the contractor to rectify / in house maintenance	Low

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

Process stage	Event	Status	Ops mitigation	Odour risk after mitigation
Primary raw sludge screening - Strain press	Units open for maintenance	P	Clean down unit	Low
Primary raw sludge - Screenings skip	Spills and uncollected skips	F	Clean up spillages ASAP and chase contractor.	Medium
Picket Fence Thickeners	Spills	R	Any spillage is cleaned by Site Tech 1s ASAP	Low
	Units drained down and being cleaned	P	Clean as quickly as possible once open	Low
	Hatches left open	R	Close ASAP	Low
	Drain covers not in place / sealed	R	Ensure covers are in place and sealed	Low
SAS Thickening - Dewatering building	Spills	R	Any spillage is cleaned by Site Tech 1s ASAP	Low
Sludge Blending Tank	Drained down for cleaning	P	Clean as quickly as possible	Low

	Spills	R	Investigate cause and clean up ASAP	Low
Primary Digestion	Release of biogas	R	Avoid gas consumer outages	Low
Primary / Secondary digesters	Spills	R	Investigate cause and clean up ASAP	Low
Secondary digesters	Tank decommissioned for cleaning	P	Clean down ASAP	Low
	Release of biogas	R	Investigate cause and rectify	Low
Secondary Digestion and Mixing - Emergency storage tanks	Used	R	Pump tanks out ASAP	Low
Digested Sludge Dewatering Buffer Tank	Tank drained down	P	Clean down ASAP	Low
Belt presses	Spillages	R	Clean up ASAP	Low
Biogas system	Release of biogas from over pressure valves	R	SCADA monitoring / Investigate cause and rectify	Low
	defect identified	R	immediately reported to the Performance Manager.	Low
Cake Pad	Straw amending	R	Minimise activity	High
	Excessive cake stored on the pad	R	Biorecycling to source outlets	Medium
Vehicle Movements	Failure of wheel wash	R	Find cause and resolve (currently out of service)	Low
Waste Gas Burner - Flare stack	Failure allowing gas to escape from digesters	R	Regular service contract / Investigate and rectify. Under normal operation the CHP and boilers are consuming the biogas.	Low
Standby Generators	No site power	R	None	Low
OCU - PFT & Sludge Blending Tanks	Failure	R	Hydrogen Sulphide levels are measured from the exhaust on SCADA. Media replacement through capital funding if media failure. Monitor remotely.	Low

OCU - PFT & Sludge Blending Tanks	Maintenance	P	Consult the contractor to rectify / in house maintenance	Low

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

Process stage	Event	Status	Ops mitigation	Odour risk after mitigation
Fire	Failure of fans or sludge building	E	Temporary carbon units can deployed by odour control in an emergency scenario.	Low/Medium
Severe weather	Transport of sludge cake from site inhibited resulting in back up of sludge cake on site	E	Event unlikely as there is provision for 75 days storage on site plus additional storage in the existing emergency sludge holding tanks.	Low
Flooding	Flooding causing process or equipment problems	E	Not an identified problem at Hogsmill. Site incident procedures would be followed.	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 fans leading to loss of odour control	E	Emergency power generation for critical activities until power restored. 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
Other incidents	Transport of sludge to land inhibited for other reasons leading to back up of sludge cake on site	E	Provision for 75 days storage on site plus additional storage in the existing emergency sludge holding tanks. Transport to other STWs if necessary.	Low

4.3.3 Spillages

Spillages significant enough to cause odorous emissions will be cleared as soon as possible. The person discovering the spillage will inform site management, who will assess extent and arrange resources as required to clear it.

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 conventional digestion site such as Hogsmill the processes is maintained around pH 7 but within the range 6.72 – 7.6 (this is % dry solids and digester load dependant) for healthy operation.
- alkalinity: Levels dependant on feedstock characteristics (primary sludge: surplus activated sludge (SAS) ratio). Conventional digestion typically, 3,500 - 5,000mg/litre range.
- temperature: minimum target of 38°C. This is maintained within the range 36- 40°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. Hogsmill fits into the first row of the table.
- Dry solids feed: see table above, Hogsmill has a target of 6%DS, but this can vary between 3-8%DS and impacts the HRT

Type of Digestion	0%- 35% SAS[x]	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 monitoring, site and sludge inspection rounds and sludge blanket checks are recorded in the Daily Data Sheets, site logbook and in the Cockpit. Records of skip management, which collect wastes generated from UWWTD activities, and any spillages and remedial actions are held in the ELogbook. Sludge blanket levels are recorded on run charts and electronically via the Cockpit.

There is a SCADA system at this site. The hydrogen sulphide concentration at the exhaust of the inlet works and sludge OCU is continuously monitored through the SCADA system. Up to sixty days historic H_2S data can be extracted from SCADA.

A monthly condition report on the OCUs is sent to the site manager by the contractor and stored on SharePoint. The weekly checks performed on the OCUs are recorded on SAP and the check sheets filed by the Tech 1s.

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 is supported by permanent standby generation.

Absence of key staff should not affect the running of Hogsmill 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 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 a 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 Hogsmill 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 (m^3/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.

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

The hydrogen sulphide concentration at the exhaust of the inlet works and sludge OCU is continuously monitored through the SCADA system. The hydrogen sulphide monitors are also serviced by a specialist contractor on a monthly basis.

H_2S Monitor	Range 0 – 2 ppm H_2S
High Alarm	0.1 ppm
High High Alarm	0.25 ppm

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 H2S) 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 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 H2S) 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 H2S) 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 site.

Contractor service reports are held by the Performance Manager.

5.2 Fault Reporting

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

5.3 Emergency Repairs

24-hour maintenance cover is available at the discretion of the Process Controller or Performance 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 Hogsmill 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 Hogsmill 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 the Royal Borough of Kingston-upon-Thames Environmental Services, their contact details are as follows:

Royal Borough of Kingston-upon-Thames - Environmental Services
Telephone: 020 8547 5002

Customer contacts regarding Hogsmill 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 at 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 Hogsmill 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 Customer & Stakeholder Manager 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 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 Environmental Health Officer of the Royal Borough of Kingston-upon-Thames (020 8547 5002) 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

Hogsmill%20STW%20SERV%20Odour%20

Appendix 2. Odour Improvement Plan

This Odour Improvement Plan was updated in July 2022.

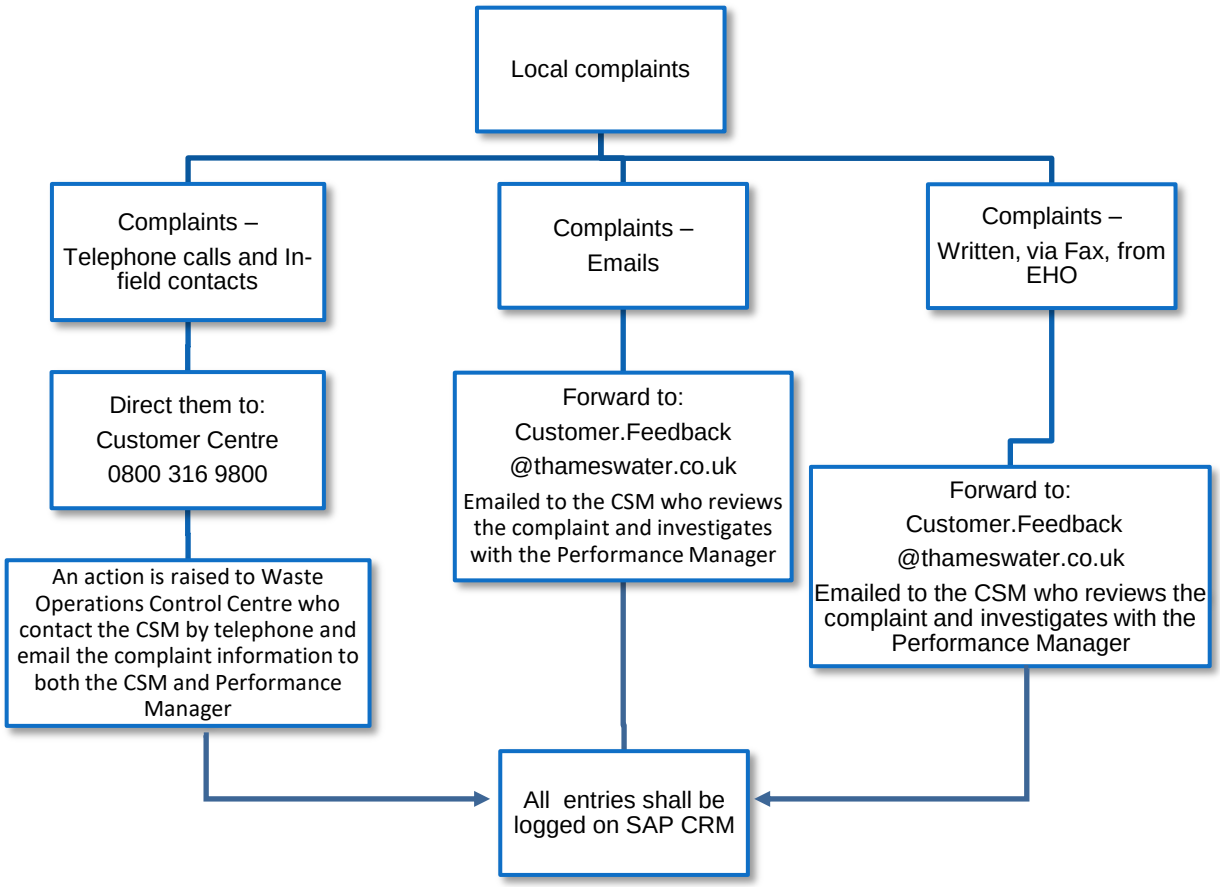
Odour Improvement Plan Hogsmill STW

Review Date		Jul-22				
Process Stage	**Owner**	**Plan**	**Action**	**Expected difficulties**	**Measures to mitigate**	**Timeframe**
Storm tanks		Additional storm tank capacity of 22,500 m3 (making total vol approx. 31,000m3). Plus upgrading of existing tank cleaning system.	Capital project.	Removal of spoil in new tank location - potential for contaminated spoil	There is already a cleaning system in place - manual cleaning of existing tanks is carried out as required	Mar-24

Appendix 3. Customer Communications Plan

Complaints Process

All locally received complaints are re-directed to the Customer Centre. Please see 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:	[redacted]
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
Local residents associations *(if applicable)*	As required but at least annually	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
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: • Non-compliant with Operational Asset Standards on one or more sub-processes leading to increased odour risk.			
Communications Approach	As Level 1 plus: • 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
Environment Agency	Potential for notification procedure	As required as per notification procedure	As required as per notification procedure	Pollution desk
Local residents associations (*if applicable*)	Immediately then monthly	Telephone / email / meeting	Report unstable operation with action plan	Performance Manager and Customer & Stakeholder Manager
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 Hogsmill 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

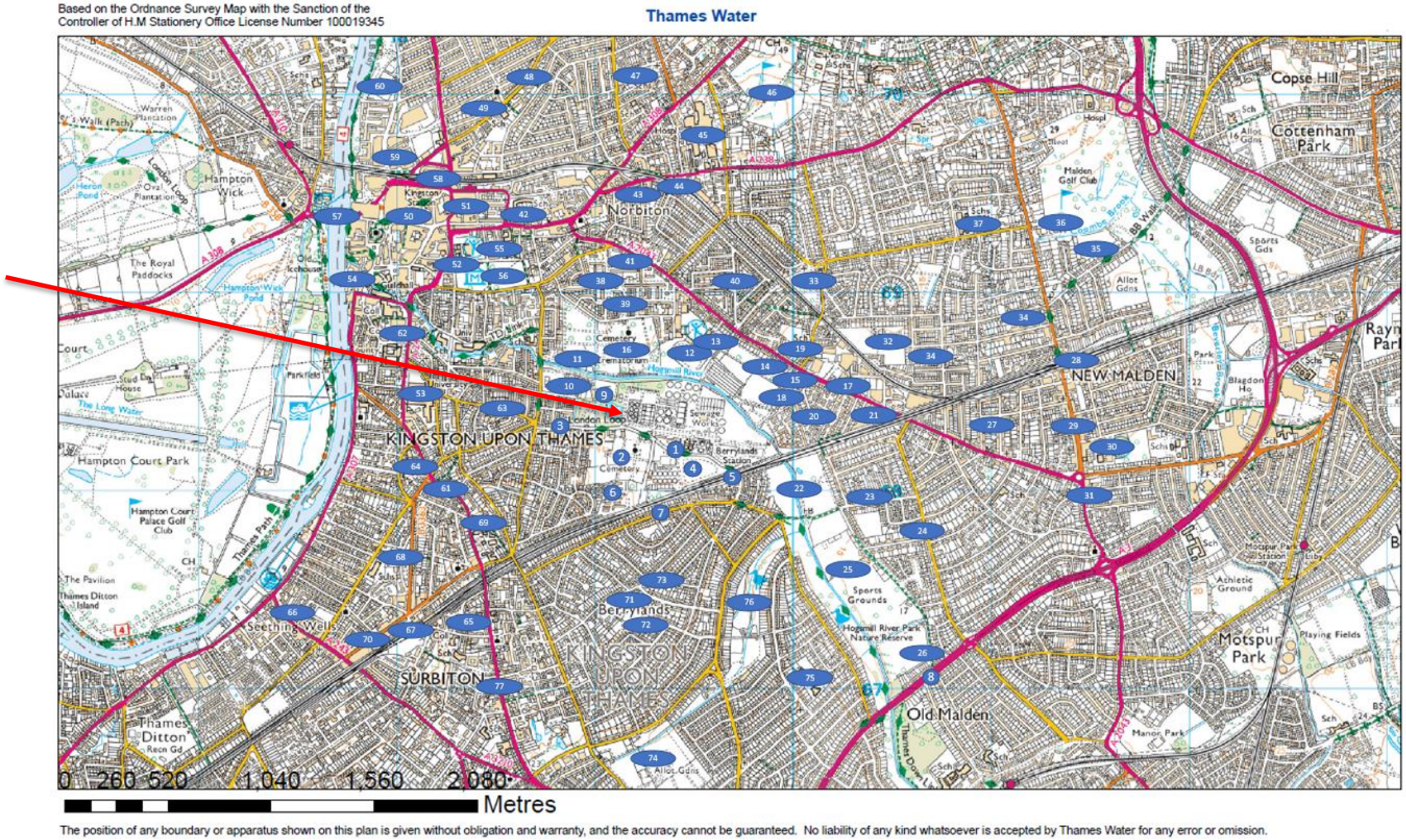
Level 3	Emergency • Temporary or transient activities not deemed to be compliant with Operational Asset Standards. High risk of odour emitting plant.			
Communications Approach	As level 2 plus: • Odour event set up internally (including OOH's cover from OMC (Kemble Court)). • Weekly discussions with 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 Manager (Operations Manager) / Level 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 Manager (Operations Manager) / Level 4 Manager (Regional Operations Manager)
Local Environment Agency officer	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	Duty Manager

			from customers (reactive only)	

Other areas/stakeholders outside Hogsmill 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	Performance Manager and Customer & Stakeholder Manager

Appendix 4. Site Drawings

Figure A - Site Location Map



The position of any boundary or apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. No liability of any kind whatsoever is accepted by Thames Water for any error or omission.

Figure B - Site Plans

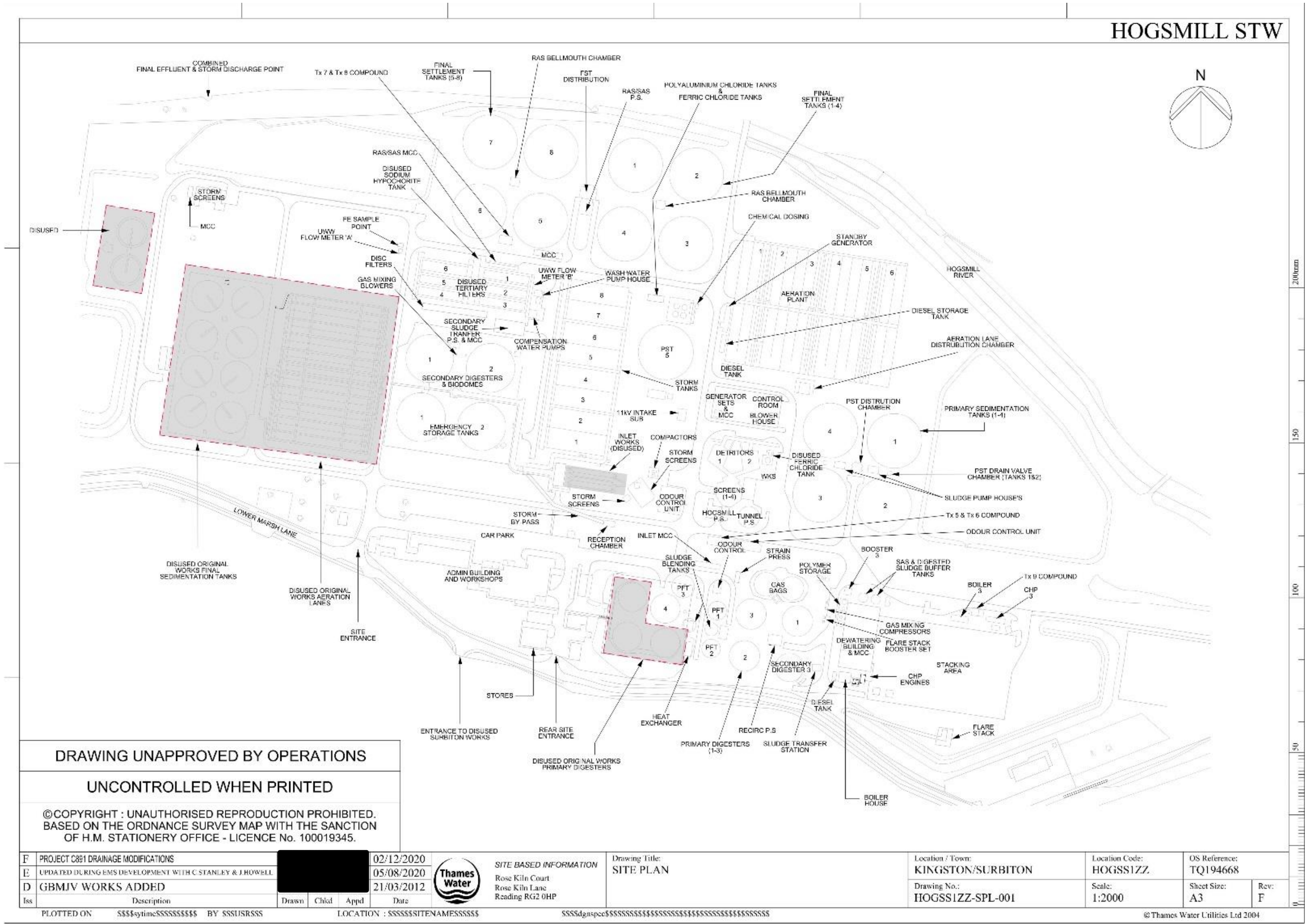


Figure C – Area Permitted under Sludge Treatment Centre Permit

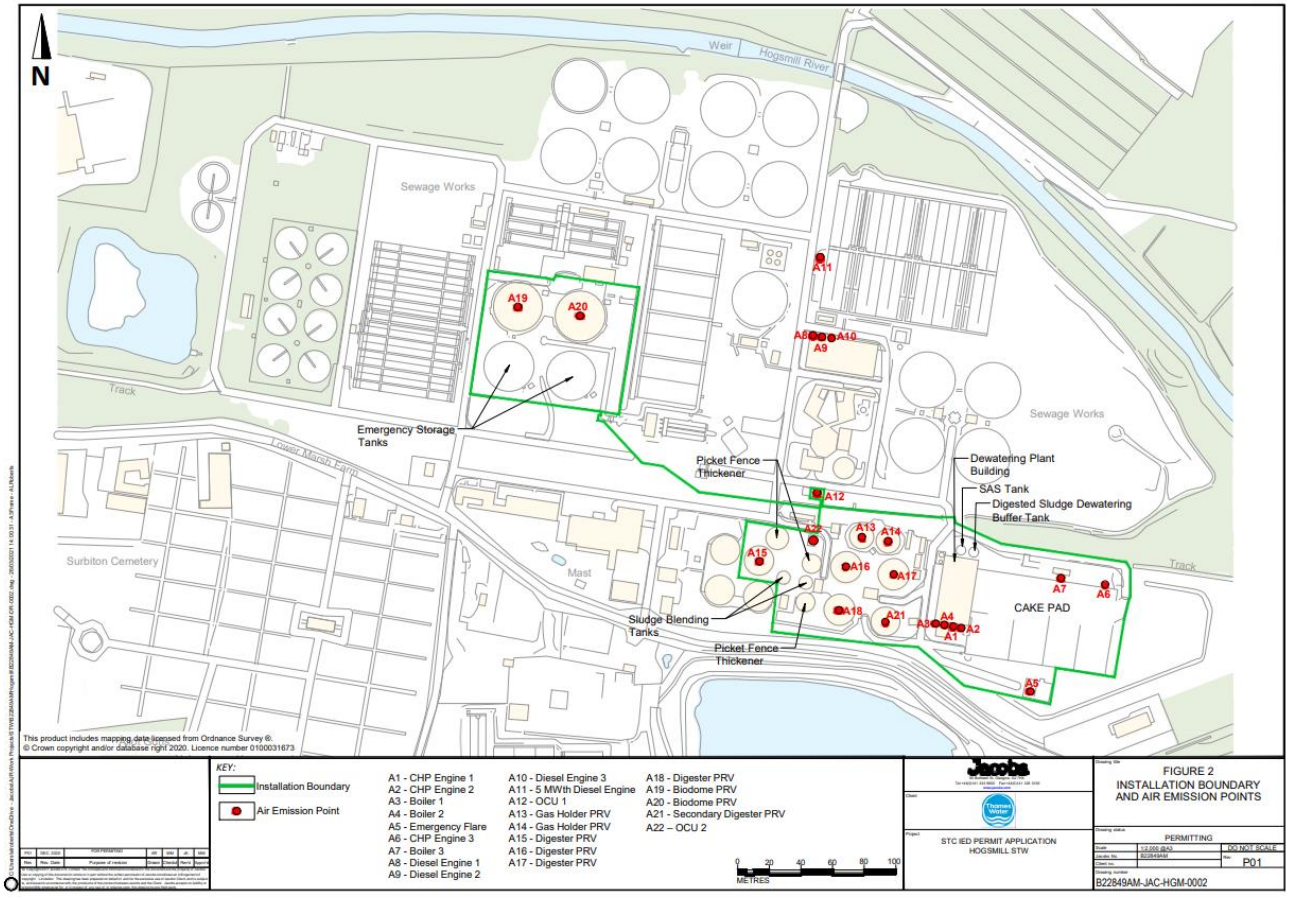


Figure D1 - Process Block Diagram for Whole Site

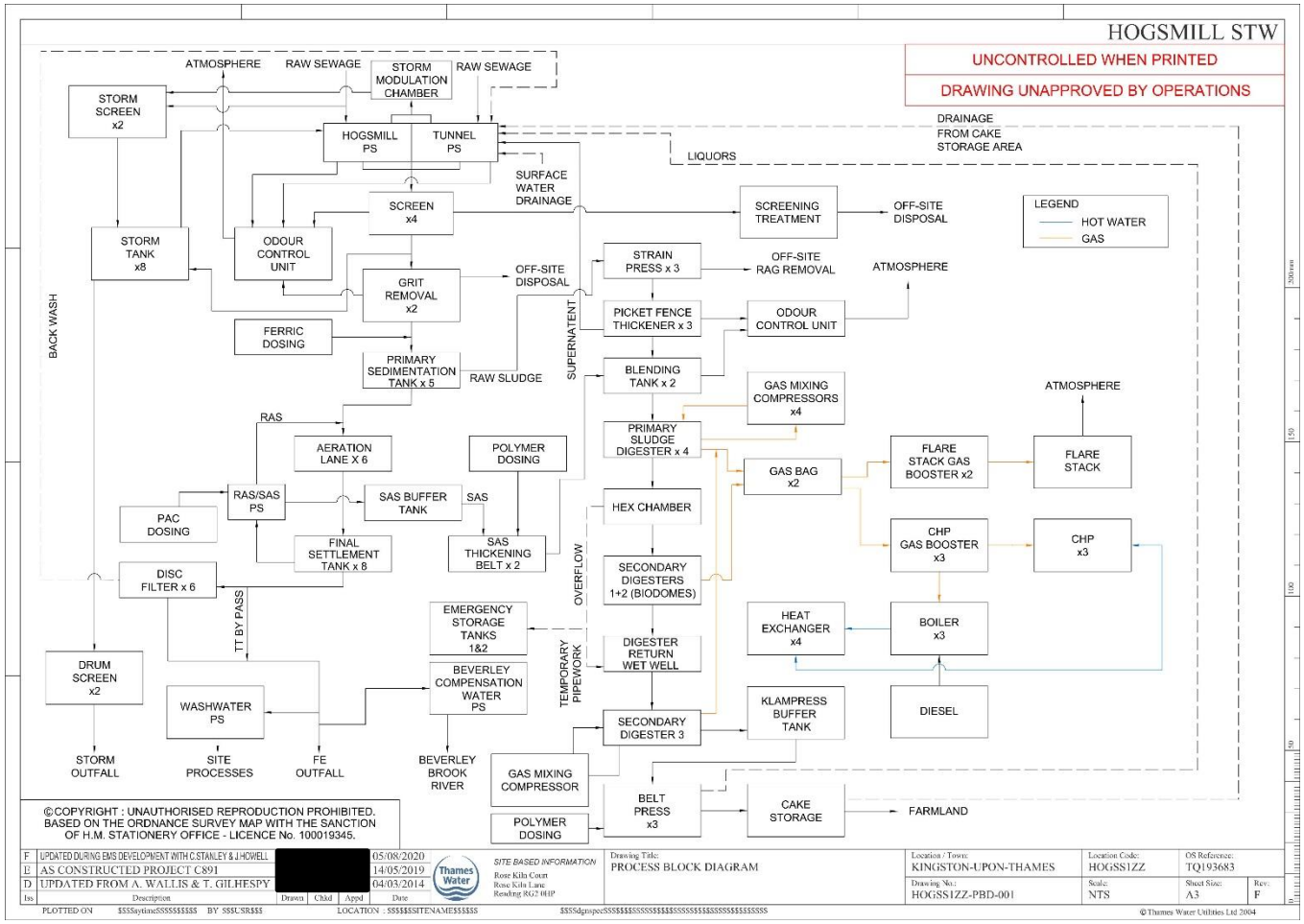
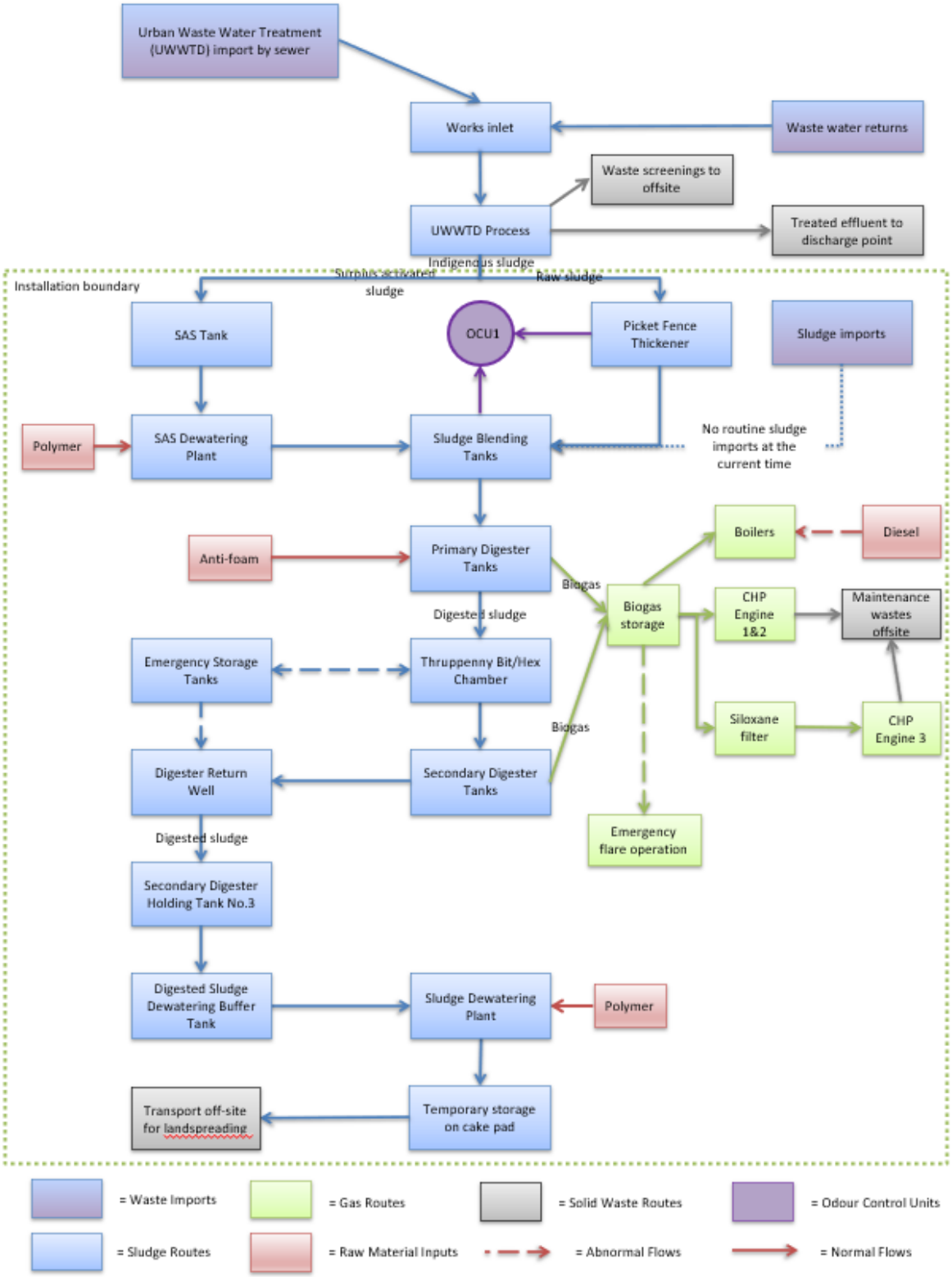


Figure D2 - Process Block Diagram for Permitted Activities



Appendix 5. Site Rounds

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**	

ID	Instruction	Daily	Weekly
b)	Check screen operation and check for screenings carryover. 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	**X**	
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**	

ID	Instruction	Daily	Weekly
2.4	**Screenings handling**	Daily	Weekly
a)	Check control system and amps on panel for normal levels / operation, take appropriate action as required. Jumping amps indicates a blockage.	**X**	
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**	

ID	Instruction	Daily	Weekly
h)	Clean grit channel as required. Check grit build up in inlet channels and clean out if necessary.		X
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)	During storm 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

ID	Instruction	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	
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/scraper 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	

ID	Instruction	Daily	Weekly
l)	Check recycle pumps are running, as required (Biological Nutrient Removal -BNR plants)		**X**
m)	Check redox monitor is operating correctly (BNR plants)		**X**
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**	

ID	Instruction	Daily	Weekly
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	
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	

ID	Instruction	Daily	Weekly
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	
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	

ID	Instruction	Daily	Weekly
b)	Check weir overflow quality and the surface of the unit. Clear any buildup of debris	**X**	
c)	Log blanket measurements / pump timers	**X**	
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**	

ID	Instruction	Daily	Weekly
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
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	

ID	Instruction	Daily	Weekly
	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**	
	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?		

ID	Instruction	Daily	Weekly
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**	
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. Sludge Rounds

	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**	

	Instruction	Daily	Weekly
h)	Manually check gas isolation valve handle operation by closing & opening valve.		X
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	

	Instruction	Daily	Weekly
g)	Check external storage tank bund for rainwater and/or chemical. Empty as appropriate.		**X**
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**

	Instruction	Daily	Weekly
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**
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**	

	Instruction	Daily	Weekly
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**	
b)	Dry powder - check supply of polymer held in silo; Top up, replace, order as appropriate	**X**	
c)	Dry powder - check bunded 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 ----