

Sandown STC

Odour Management Plan

790101_ERA_OdourMP_SAN

July 2024
V5



from
**Southern
Water** 

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Issue and Revision Record

Revision	Date	Originator	Checker	Approver	Description
A	19/12/2023	Olivia Ellson David Vargas	David Dray	Anita Manns	Version 3
B	21/06/2024	Shannon Stone	Anita Manns	Anita Manns	Version 4 – in response to Environment Agency queries June 2024
C	11/07/2024	Shannon Stone	Anita Manns	Anita Manns	Version 5 – removed reference to generators

Document reference: 790101_ERA_OdourMP_SAN July 2024

1. Odour Management Plan

1.1. Introduction

The Odour Management Plan (OMP) for the Sandown Wastewater Treatment Works (WTW) and Sludge Treatment Centre (STC) ('the Site') has been developed by Mott MacDonald on behalf of Southern Water Services ('Southern Water' or 'the Operator'). The OMP remains the responsibility of Southern Water as the OMP may assume a legal status if it forms part of the planning conditions or other legal agreements with local authorities or other third parties.

The OMP has been designed to be a live working document that forms part of the operational management system of the Site. It is a mitigation and control measure document with which operations shall comply. It demonstrates how odours shall be managed and controlled to prevent odour impacts from activities during normal operation and during abnormal events.

The OMP has been produced in accordance with the Environment Agency's H4 Odour Management guidance¹. Best Available Techniques (BAT) Reference Document for Waste Treatment² and Appropriate measures for the biological treatment of waste³.

1.2. Objectives

The OMP identifies potential odour emissions from site operations and identifies procedures to manage, control and minimise odour impacts. It is based on a plan prepared by Southern Water and provides information about the measures currently implemented to control odour emissions from the Site. It provides sufficient detail to allow operators and maintenance teams to understand the operational procedures for both normal and abnormal operational conditions.

It is intended to be used as a reference document by operational staff on a day-to-day basis. The OMP includes the following:

- A description of the Site and catchment, including potential sources of odour on the Site, and location of sensitive receptors
- The Site's individual process operation descriptions in order to minimise, manage and control odour
- Characterisation of odours at different points in the treatment process and assessment of risk, particularly during abnormal operating conditions
- Southern Water Operation and Management (O&M) procedures for the Site, including housekeeping measures to minimise odour generation and release

¹ Environment Agency (2011), *Environmental permitting: H4 odour management*. Available online at: <https://www.gov.uk/government/publications/environmental-permitting-h4-odour-management>

² Joint Research Centre (2018) Best Available Techniques (BAT) Reference Document for Waste Treatment. Available online at: https://eippcb.jrc.ec.europa.eu/sites/default/files/2019-11/JRC113018_WT_Bref.pdf

³ Environment Agency (2020) Appropriate measures for the biological treatment of waste- Consultation draft July 2020 Available online at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/898966/Appropriate_measures_for_the_biological_treatment_of_waste_-_consultation_document.pdf

- The mitigation procedures which should be implemented when foreseeable situations, that may compromise the ability to prevent and minimise odorous releases, occur. These can include both breakdowns and external conditions such as extreme weather
- An odour risk assessment identifying any odorous or potentially odorous areas of the works and immediate and longer-term actions required to eliminate odour complaints
- Containment, enclosure, ventilation, abatement of odours and emission standards
- Monitoring of odorous emissions and action plans for investigation, remedial measures and procedural changes in the event of abnormal emissions
- Management of the sludge reception, dewatering and treatment processes
- Odour control and management procedures during emergencies and maintenance
- Routine care and maintenance of critical equipment (extraction and odour abatement plant)
- Monitoring, recording and reporting arrangements
- The management and operator training requirements and records with respect to odour
- Staffing, responsibilities, training and procedures
- Communication strategy and complaint management/resolution procedures
- OMP updating, review and development procedures
- An action procedure for complaints

The primary responsibility for implementation of the OMP lies with the operational site management. Other business functions support the implementation of the OMP across their areas of responsibility.

The OMP outlines the sources of odours and the risks to receptors. It outlines the measures Southern Water will employ on a daily basis and how Southern Water will respond to prevent or minimise odour releases and impacts. The routine assessment of odour and the monitoring and maintenance of plant and equipment at the Site will be carried out according to the schedules given in the Operation and Maintenance (O&M) manual and Environmental Management System (EMS) to ensure that performance is optimised.

The OMP will be reviewed, and amended where necessary, following changes in infrastructure or changes in operation that have an impact on odour at the Site. Otherwise, the OMP will be reviewed annually, as a minimum, or as requested by the Environment Agency. The OMP is incorporated into the Site's Environmental Management System.

1.3. Site location

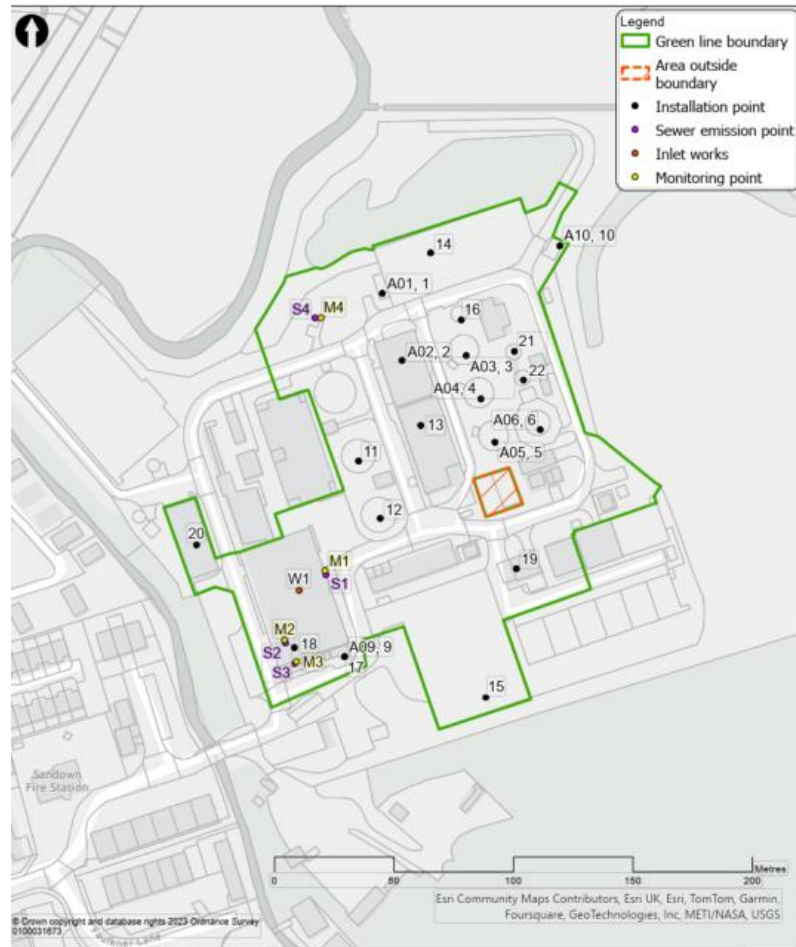
The Site is located at the north-eastern extent of Sandown town, to the south-east of the Isle of Wight. Sandown catchment serves most of the Isle of Wight with a population equivalent of approximately 138,000.

Activity address: East Yar Road, Sandown, Isle of Wight, PO36 9AX

National grid reference: SZ 6027 8523

The Site location and layout are shown in Figure 1.

Figure 1: Location and layout of the Site



Emissions Ref	Emissions Points	Assets Ref	Assets	X	Y
A01	CHP unit	1	CHP unit	460257	85378
A02	Boilers	2	Boilers	460265	85350
A03	Whessoe valve 1	3	Digester 1 and associated whessoe valve	460292	85352
A04	Whessoe valve 2	4	Digester 2 and associated whessoe valve	460298	85334
A05	Whessoe valve 3	5	Digester 3 and associated whessoe valve	460304	85316
A06	Whessoe valve 4	6	Gas holder tank and whessoe valve	460323	85321
A09	Odour control unit	9	Odour control unit	460241	85226
A10	Flare stack	10	Flare stack	460331	85398
W1	Inlet works emission point			460222	85254
S1	Liquor to sewer emission point			460233	85262
M1	Liquor monitoring point			460233	85262
S2	Cess waste to sewer			460216	85233
M2	Cess reception monitoring point			460216	85233
S3	Tankerred waste to sewer emission point			460221	85224
M3	Tankerred waste monitoring point			460221	85224
S4	Liquor return pumping station			460231	85368
M4	Liquor return monitoring point			460231	85368
		11	PSST 1	460247	85308
		12	PSST 2	460256	85284
		13	Drier and centrifuge building	460273	85323
		14	Cake bays (North)	460277	85395
		15	Cake bays (South)	460300	85209
		16	Digester feed tank	460290	85367
		17	Chemical storage (for odour control)	460241	85226
		18	Tanker, cess and sludge reception building	460220	85230
		19	Oil storage	460313	85263
		20	Chemical storage building	460179	85273
		21	PDST 1	460312	85354
		22	PDST 2	460316	85342

*Area outside boundary is the 'Outfall Pumping Station'



Title Sandown STC Site Layout Plan		MOTT MACDONALD Mott MacDonald House 8-10 Sydenham Road Croydon T +44 (0)20 8774 2000 W mottmac.com					
Date	Drawn	Checked	Approved	Scale at A4	Drawing Number	Status	Rev
11/07/2024	M Pinney	S Stone	A Manns	1:1,750	790101_MSD_SiteLayoutPlan_SAN	INF	03

1.4. Best Available Techniques

This document reflects the existing arrangement at site and any commitments Southern Water has already made during the ongoing application process. It is acknowledged that it does not fully meet BAT in some instances. Changes to site will be undertaken and completed to meet BAT, where applicable. The changes required will be submitted to the Environment Agency, in plans to be submitted as part of Improvement Conditions within the permit, for their agreement and Southern Water's subsequent implementation.

As the changes are implemented the documentation will be updated to reflect the changes made to meet BAT.

The OMP addresses the following BAT:

- BAT 1: Environmental Management System to include the Odour Management Plan
- BAT 10: Periodically monitor odour emissions
 - Section 5 addresses monitoring
- BAT 12: Implement and regularly review an odour management plan, as part of the environmental management system, including protocols for:
 - Actions and timelines (addressed in Section 4.2 and 5)
 - Conducting monitoring (Section 5)
 - Response to identified odour incidents (Section 7.4 and Appendix G)
 - Odour prevention and reduction (Section 4, 5 and 6)
- BAT 13: Reducing odour emissions through the use of techniques: addressed in Section 4
- BAT 14: Reducing diffuse emissions to air, addressed in Section 3.2
- BAT 33: Control of odour emissions through pre-acceptance, acceptance and sorting the waste addressed in document reference 790101_MSD_DutyofCare_SAN December 2023
- BAT 34: Reducing channelled emissions, addressed in Section 4.1.
- BAT 53: Reducing emission of hydrochloric acid (HCl), ammonia (NH₃) and organic compounds to air in Section 4.1.

The OMP is applicable to the STC operations only and any mention of the wider WTW is for context only.

2. Site Operations

2.1. Overview of site operations

The WTW is operated under the Urban Wastewater Treatment (England and Wales) Regulations 1994 and has a standalone Water Discharge Activity Environmental Permit, this will remain an independent permitted activity.

The waste activity comprises imports, physio-chemical and anaerobic digestion (AD) treatment, and the storage of waste, all for recovery purposes. The STC solely handles waste derived from the wastewater treatment process, either indigenously produced on-site or imported from other Southern Water owned assets. The Site undertakes AD of sewage sludge from the on-site WTW and liquid imports from up to 18 satellite WTW Sites across the island, and will continue this operation under a new bespoke Industrial Emissions Directive (IED) installation permit.

The primary permitted installation activity will be the AD treatment facility. The AD facility will treat indigenously produced and imported sludges. Permitted Directly Associated Activities will be the import of waste from other WTW assets; the physio-chemical treatment of imported and indigenously produced sludges; the storage of indigenously produced sludges, imported sludges and the sludge cake from the AD facility; the storage of biogas derived from the AD treatment of waste; and the combustion of biogas in an on-site Combined Heat and Power plant (CHP). In the event the CHP cannot run in an emergency or due to operational issues, biogas will be combusted via an on-site flare stack and/or back-up boiler system.

2.2. Summary of the STC components

Currently the Site accepts indigenous sludge, imported liquid sludge and cess, septic and chemical toilet waste.

On average the site accepts 15 tankers per day (over a 5-day week) containing sludge, cess, septic, chemical toilet waste. This consists of approximately four tankers per day of liquid sludge imports arriving at the site. Up to 11 tankers of imported cess, septic and chemical toilet waste per day is accepted at the site. All waste is delivered to the Site in enclosed and sealed tankers.

The Site does not accept tankered trade waste.

Below is a brief summary of the STC components for the Site.

2.2.1. Sludge treatment at the STC

The Site contains an STC which has both liquid sludge and indigenous sludge reception facilities.

STC Building

The STC Building is a fully enclosed building, which houses the majority of the sludge treatment facilities. This building ensures that odorous air from the enclosed process are effectively captured for treatment. All activities concerned with the reception of imported sludge are housed within the STC building from which air is extracted to the odour control system. Each sludge process unit, and the space within which it sits, is enclosed to form an odour-controlled enclosure within the building. Similarly, each vehicle delivery bay associated with the process inputs and waste arisings are enclosed units within the building, from which the air is extracted to the central odour control unit.

Delivery vehicles discharge liquid sludge within a specific enclosure in the STC building into liquid sludge reception facilities prior to screening and thickening with indigenous sludge in gravity belt thickeners. An interlock system is fitted to prevent deviation from the sludge import operating practice detailed above. Exhaust fumes from the vehicles are vented separately to prevent the build-up of fumes within the building.

Reception and Screening of Imported Liquid Sludge and Cess and Septic

Liquid sludge is imported into Sandown WTW using tankers from up to 18 satellite WTW sites across the Isle of Wight. On average four tankers per day (over a 5-day week) deliver sludge to the Site, and average of 11 tankers per day of domestic waste is delivered to the Site. The tankers are sealed to prevent any escape of malodours. Liquid sludge is transferred from tankers into one sludge reception tank (83m³) which is located within the STC Building. The process is enclosed to ensure capture of odorous air for treatment. Both indigenous and imported sludge are pumped by two submersible sludge pumps through two strain presses. Screened sludge is transferred via one screened sludge transfer tank (10m³) to two screened sludge storage tanks (with a total volume of 2,175m³) from where it is fed to two gravity belt thickeners.

Sludge Storage

Sludge storage is provided between each of the main sludge processing stages by means of cylindrical storage tanks. Sludge is first stored in two screened sludge storage tanks after being produced by the primary settlement stage. It is then stored in one digester feed tank (250m³ capacity) after being thickened. After the digestion process, it is stored in two post-digestion storage tanks (245m³ each). All of these tanks (digester and post digestion storage tanks) are enclosed to capture odorous air for combustion. Air is extracted from each tank to the CHP unit. The sludge storage tanks are mixed using enclosed macerator pumps located outside the digesters. Therefore, there are no mechanical parts inside the tanks requiring access at regular intervals for maintenance purposes. Routine maintenance of the tanks and external mixing pumps would be subject to the Site odour risk assessment. Odour suppressant sprays would be used as necessary during this operation.

Thickening of Liquid Sludges

Sludge thickening is undertaken to increase the solids content of the sludge. This is achieved by means of mechanical equipment that is housed within a building to contain odorous air for treatment.

Centrate and decant liquor from the thickening process gravitates to the Site's liquor pumping station and is returned to the WTW for further treatment.

The sludge is thickened in belt thickeners with a combined throughput of 80m³/hour. The thickeners are designed to give 150% capacity at average loads when operating 24 hours a day, seven days a week, and receive sludge at approximately 3% dry solids and raise it to 7%. The thickeners are individually covered and vented to odour control and the building is also extracted to the odour control system.

Digesters

There are three large sealed, conventional mesophilic anaerobic digesters (1,285m³ each) operating at around 35°C. The AD process provides a controlled environment where micro-organisms (including bacteria and fungi) can grow, multiply and break-down organic material, releasing water, carbon dioxide and methane (biogas). Gas production, gas pressure and digester temperature are monitored and logged on the SCADA system. The produced gas is stored in one biogas holder, which is a double skinned, expandable, hemispherical container. A biogas burner is provided for periods when, for example, the CHP are unavailable during maintenance or downtime, to control and manage excess gas during these periods.

In instances where the gas pressure is too high the pressure relief valve system de-pressurises the system. These pressure relief valves are located at the connection point with the biogas distribution system pipework at the top of each digester. Opening of the pressure relief valves is an emergency response of the system to maintain safety and would be rare, short-lived events. Pressure levels are monitored in the gas system and linked to the SCADA system. This is provided with an alarm which can alert operators to increased pressure. The performance of the digesters is monitored daily, through the sampling of inlet and outlet sludge quality.

Combined Heat and Power (CHP)

A CHP plant is installed at the Site, designed to use biogas. The biogas produced in the digestion process is burnt in the CHP unit and two standby biogas and natural gas boilers to generate electricity and heat. The electricity is used to partially power the WTW and STC, and heat is to be recovered and used to heat the digesters. There is also a backup flare for use when the CHP engine is on downtime for maintenance. The CHP area is not located in a building but housed in acoustic containers.

Post Digestion

Digested sludge is stored in two post digestion sludge tanks (245m³ each) prior to being dewatered by two centrifuges.

Dewatering

Dewatering takes place in two centrifuges (one standby, one duty). Dewatering further reduces the volume of sludge. Dewatered digested cake is stored in uncovered cake bays, before being transported off-site for storage prior to spreading onto land. The Site features a sludge drying system, however, this has been mothballed and is no longer in use.

Liquor from the dewatering plant gravitates to the Site's liquor pumping station and is returned to the WTW for further treatment.

Centrifuges are operated on a duty/standby system (one duty, one standby) to ensure that processing continues during periods of maintenance and repair. The centrifuges are housed within the STC building, which is connected to odour control. The centrifuges are maintained as part of the framework maintenance contract which also provides an emergency response.

Cake storage

Dewatered sludge is stored in the form of a cake in one of six cake bays. These cake bays are open to the air. Cake maturation takes approximately 42 days.

Odour control unit

Odour is controlled via one current odour control unit (OCU). The main odour control package at the STC comprises a two-stage chemical scrubbing plant and a polishing carbon filter (not currently in use). The chemical scrubbing plant includes a first acid scrubber for the removal of odorous basic compounds such as ammonia and a second stage alkali scrubber for the removal of acidic odorous compounds such as hydrogen sulphide. The Inlet Works Building, Sludge Building and Sludge Recirculation Kiosk contain process plant likely to produce odour and have separate ventilation system to connect to the OCU.

Odour is controlled via one current Odour Control Unit (OCU), a two-stage chemical scrubbing plant venturi. Filtered odour streams are discharged into the environment through OCU stack referenced as "A09" in Figure 1 and are monitored hourly to ensure the absence of odorous compounds. The OCU treats air from the sludge treatment building and the sludge reception tank.

In order to minimise cross contamination between different zones of the Site, and the escape of odorous air to the atmosphere, wet areas with high turbulence are maintained at a lower pressure than the surrounding areas by higher extraction rates. These design features help minimise fugitive emission of odours from more contaminated areas to less contaminated areas or uncontaminated areas.

Extract fans from the wet areas and the building exhaust fans are sized to maintain the required extraction flow rates which are higher than the flow rates of building inlet fans.

Air extracted from clean areas is discharged to atmosphere, untreated. Air extracted from buildings is treated by alkaline scrubbers and final polishing by activated carbon filters before discharge via the stack. Air from wet areas, channels and tanks is treated by acid scrubbing, followed by alkaline scrubbing and final polishing.

This odour control system operates with duty and standby fans and recirculation pumps. The odour control system has backup power available from the CHP plant should normal supplies be interrupted. Site personnel check SCADA regularly throughout the day for a range of parameters concerning the odour control unit, including control parameter set points, emission concentrations, alarms and chemical levels. The control system is designed to provide warning alerts at threshold levels. Response procedures, in case of an exceedance event are described elsewhere in this OMP.

Odour is monitored in the cess and sludge import area via odour loggers. Other odour mitigation measures implemented on-site include placing covers on containers and limiting the height of rising sludge. Perimeter sprayers are present and operational in certain areas of the Site and all waste is imported in covered lorries or contained in tankers.

Leak detection (methane gas analyser) is also installed on biogas holder/s to ensure any leaks from the inner bag are detected. Any leaks detected on the biogas system would always be fixed immediately by Southern Water due to the process safety risk posed by biogas.

The use of odour atomisers during unloading of waste into the system is to be considered. The removal of biosolids off-site will be undertaken as soon as practically possible whilst considering prevailing weather conditions.

Other relevant STC components

- 1 No. Sludge reception tank (83m³)
- 2 No. Sludge strain presses
- 1 No. Screened sludge transfer tank (1,088m³)
- 2 No. Screened sludge storage tanks (2,175m³ total volume)
- 2 No. Gravity belt thickeners (duty/standby)
- 1 No. Digester feed tank (250m³)
- 3 No. Digesters (1,285m³ each)
- 2 No. Post-digestion storage tanks (225m³ each)
- 2 No. Centrifuges (duty/standby)
- 1 No. Gas bag holder (780m³)
- 1 No. CHP engine
- 2 No. Auxiliary boilers (both 465 – 698kW output). Dual fuel (biogas/natural gas).
- 1 No. Biogas burner (flare)

- 6 No Cake storage bays (4,100m³).

The following are outputs from the process:

- Cake (dewatered post digestion sludge) - stored in cake bays before being shipped for use as a fertiliser;
- Bio-gas - stored in an existing 780m³ gas holder, and is then either:
 - Burnt in CHPs, with the power exported to the grid;
 - Flared in the waste biogas burner.
- Grit and screenings (small amount) – deposited in skips before taken off-site.

A schematic for the odour control units can be found in Appendix B.

3. Potential Odour Sources

3.1. Overview of the mechanisms for odour generation

The generation of odour from the processing of sewage is primarily associated with the release of odorous Volatile Organic Compounds (VOCs) that are generated as a result of the anaerobic breakdown of organic matter by micro-organisms.

Since the main source of odour and VOCs is the solid organic matter, the most intense and offensive odours tend to be generated from the operations involving the handling of sludge i.e. the processes applied to dewater, treat and store raw sludge. These processes are generally considered to present the greatest risk of odour impact off-site unless adequate controls are put in place. Depending on the quality of the sewage presented to the works, aspects of the treatment process involved in the handling of raw sewage (e.g. preliminary and primary treatment stages) may also contribute to offensive odours.

Odours generated from the sewage treatment processes downstream of the primary sludge removal stage (e.g. the activated sludge processes and final settlement) present a significantly reduced risk of odour impact. This is due to the fact that the majority of odorous biogenic material has been removed from the flow at this point, and the treatment processes applied to remove any remaining contaminants in the sewage are aerobic. Aerobic conditions inhibit the formation of the majority of the reduced sulphur compounds, which are responsible for offensive sewage odours.

The rate of odour release from sewage and sludge sources is primarily dependent on the temperature of the material, and the surface area exposed to the atmosphere. As a result, odorous emissions from sewage treatment operations tend to be highest during the summer months. Furthermore, activities that lead to increases in the surface area of odorous material exposed to the atmosphere (e.g. due to turbulence generated by sewage handling processes and agitation of sludge) will inevitably lead to an increase in the magnitude of odour released.

Southern Water acknowledges that high levels of odour arising from wastewater and sludge treatment are not acceptable and that reasonable and practicable measures must be taken to minimise any nuisance caused to the general public. Southern Water does not operate under a single defined odour exposure standard. Each site is considered individually, taking into account the relevant legislation and the local authority's conditions. Site specific factors such as site history, with regard to odour complaints, potential future encroachment by residential or business developments, and the presence of particularly odour sensitive receptors within the vicinity of the Site are also taken into consideration.

3.2. Potential odour sources

Table 1 identifies the plant, equipment and activities which have the potential to generate odours under normal operational conditions. Odour sources under emergencies and abnormal operating conditions are addressed in 4.3.3 Abnormal conditions.

Wastes accepted to the STC, under the Environmental Permit, are listed in Appendix C.

Due to the nature of the site activities, the hedonic tone of odours is neutral at best, whereas most odours generated on site will have a negative hedonic score (therefore deemed offensive). As the local population has already become sensitised to this, it is prudent to reduce the benchmark of the rating associated with sludge treatment. The hedonic score of the material will improve through the sludge treatment process as organic material is digested.

Table 1: Identified odour sources

Process or activity	Plant or equipment	Potential source of odour	Odour controls in place	Potential for odour emissions during normal conditions
Sludge reception	Sludge reception SZ 60220 85230	Indigenous sludge and liquid sludge	Sludge pumped from tanker directly into covered reception tank which is odour controlled. The reception area is enclosed. Process is completed as rapidly as possible. Air is extracted to an OCU. Stringent loading and unloading procedures – uncontrolled odour release unlikely. Doors to the building are closed at all times other than providing access to vehicles.	Low
Sludge treatment	Sludge screening SZ 60218 85263	Sewage sludge	Sludge screening tanks are covered and enclosed.	Low
	Sludge thickening SZ 60218 85263	Sewage sludge	Gravity belt thickeners (GBTs) are located within a building. The digester feed tank is covered and is located outdoors. Sludge is mixed and regular throughput is maintained Maximum storage: 250m ³ Waste retention time: N/A – not holding tanks.	Low
	Anaerobic digesters pressure release valve SZ 60292 85352 SZ 60298 85334 SZ 60304 85316	Biogas	Digesters covered, sealed and process monitored. Planned preventative maintenance regularly undertaken on pressure release valve. Maximum storage: 3855m ³	Low

Process or activity	Plant or equipment	Potential source of odour	Odour controls in place	Potential for odour emissions during normal conditions
	Post-digestion sludge storage tanks SZ 60314 85353 SZ 60318 85342	Liquid sludge	Post-digestion storage tanks are covered and enclosed, process monitored and regularly maintained Maximum storage: 900m ³ Waste retention time: N/A – not holding tanks.	Low
	Centrifuge SZ 60278 85319	Sludge cake	Centrifuges are located within the sludge treatment building and odour controlled. Planned preventative maintenance undertaken on equipment	Low
	Odour control unit SZ 60241 85226	Untreated air	Odour control unit treats air to remove odorous compounds. It is process monitored and maintenance is regularly undertaken on equipment	Low
	Cake storage bays SZ 60277 85395 SZ 60300 85209	Sludge cake	While uncovered, cake is moved to the receiving bay at the end of the treatment process so odour emissions are minimised. No disturbance of cake while in bays except for removal. Maximum storage: 4100m ³ Waste retention time: 42 days	Medium
	Biogas combustion	Gas holder SZ 60323 85321	Biogas	This is a sealed system Maximum storage: 780m ³ Waste retention time: N/A – not holding tanks.
Combined Heat and Power (CHP) unit SZ 60257 85378		Biogas	Planned preventative maintenance undertaken on equipment. If CHP unit is down, gas is burnt in flare	Low
Boilers SZ 60265 85350		Biogas	Planned preventative maintenance undertaken on equipment	Low
Flare SZ 60331 85398		Biogas	Planned preventative maintenance undertaken on equipment	Low
Sludge export	Cake export SZ 60277 85395 SZ 60300 85209	Sludge cake	Lorries/trailers are covered before leaving or sealed skips are used. Covers on lorries removed when filling with sludge cake (for export to farms) which occurs outside.	Medium

3.3. Odour impact

3.3.1. Adjoining land use

To the west of the Site is a caravan park and small industrial estate, as well as a limited number of residential properties. The area to the north and east of the Site remains as undeveloped fields. An industrial / commercial area containing an MOT centre, taxi depot, several car dealerships, and commercial premises is located to the south west. Wildheart Animal Sanctuary is located approximately 500m south east of the Site.

3.3.2. Sensitive receptors

Receptors sensitive to odour include users of the adjacent land, which may vary in their sensitivity to odour. The level of sensitivity will be defined using the Institute of Air Quality Management guidance⁴:

- High sensitivity receptors e.g. residential dwellings, hospitals, schools/education and tourist/cultural
 - users can reasonably expect enjoyment of a high level of amenity
 - people would reasonably be expected to be present here continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land
- Medium sensitivity receptor e.g. places of work, commercial/retail premises and playing/recreation fields
 - users would expect to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level of amenity as in their home
 - people would not reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land
- Low sensitivity receptor e.g. industrial use, farms, footpaths and roads
 - the enjoyment of amenity would not reasonably be expected
 - there is transient exposure, where the people would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land

The magnitude of risk relates to⁴:

- Frequency: How often an individual is exposed to odour
- Intensity: The individual's perception of the strength of the odour
- Duration: The overall duration that individuals are exposed to an odour over time
- Odour unpleasantness: Odour unpleasantness describes the character of an odour as it relates to the 'hedonic tone' (which may be pleasant, neutral or unpleasant) at a given odour concentration/ intensity. This can be measured in the laboratory as the hedonic tone, and when measured by the standard method and expressed on a standard nine-point scale it is termed the hedonic score.
- Location/Receptor sensitivity: The type of land use and nature of human activities in the vicinity of an odour source. Tolerance and expectation of the receptor. The 'Location' factor can be considered to encompass the receptor characteristics, receptor sensitivity, and socio-economic factors.

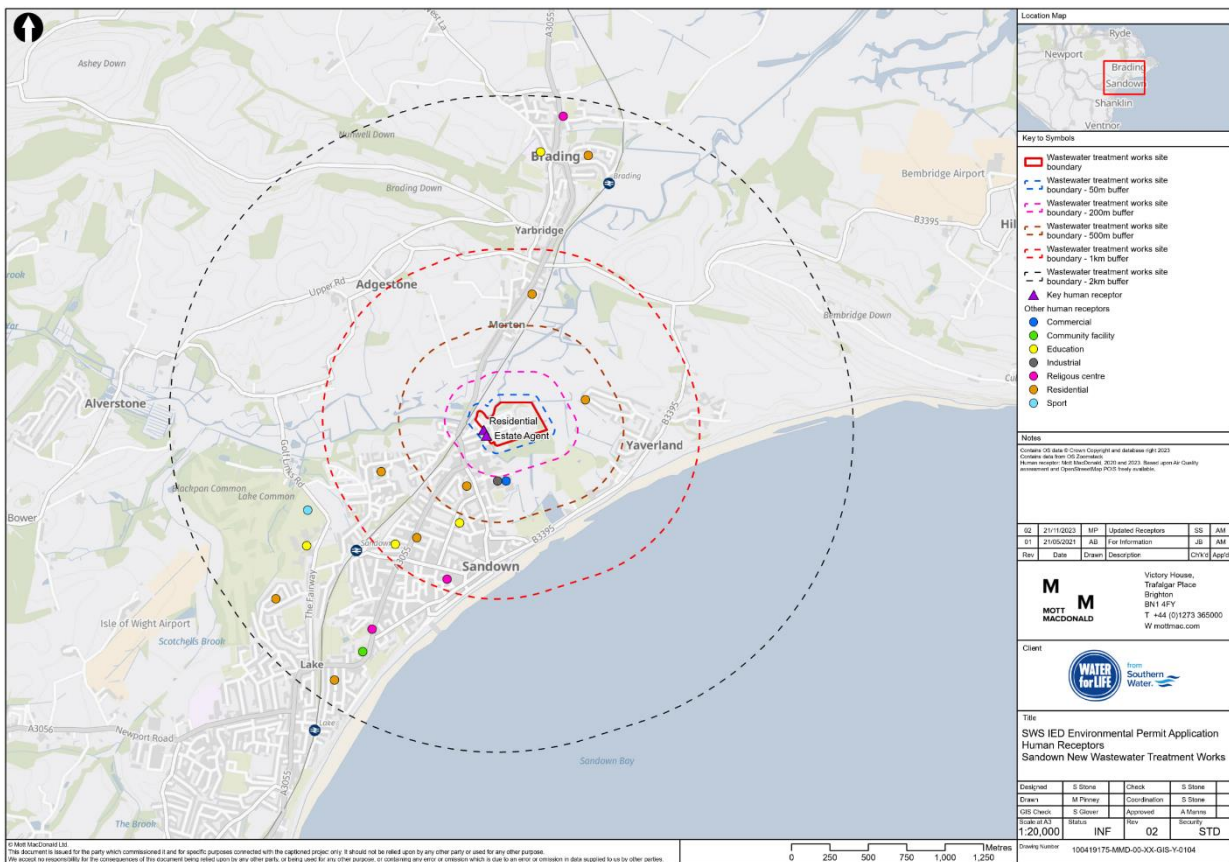
⁴ Institute of Air Quality Management (2018) Guidance on the assessment of odour for planning V1.1. Available online at: <https://iaqm.co.uk/text/guidance/odour-guidance-2014.pdf>

There are multiple sensitive receptors found within 250m of potential odour emission sources at Sandown STC. As demonstrated in Figure 2, these receptors are found to the west and south west of the Site. No sensitive receptors are found to the east of the Site, which is downwind of the prevailing wind direction.

The receptor closest to a potential emission source is an estate agent (place of work), which is located approximately 50m west of the sludge treatment building/sludge handling area. The majority of receptors are found to the west or south of a potential emission source, which is upwind of the prevailing wind direction.

Figure 2 identifies the sensitive receptors within 2km of the Site and Table 2 identifies sensitive receptors within 500m of the Site, as these will be the most likely affected receptors.

Figure 2: Sensitive receptors within 2km of the Site



Source: Mott MacDonald (2023), Sandown Bioaerosol Risk Assessment

Table 2: Receptors within 500m of potential emission sources at the Site

Receptor	Nearest potential emission source to receptor	Process	Distance (m) from nearest potential emission source	Direction of receptor from closest emission source
	Sludge handling	Sludge reception and distribution	95	South

Receptor	Nearest potential emission source to receptor	Process	Distance (m) from nearest potential emission source	Direction of receptor from closest emission source
Receptor 1 – Workplace, Estate Agent	Sludge treatment plant	Sludge treatment	95	South
	Sludge storage tank	Sludge treatment	195	South
	Digester	Sludge treatment	180	South west
	Centrifuge	Sludge treatment	165	South
	Cake bay	Sludge treatment	65	South west
	Gas bag holder	Biogas combustion	190	South west
	Flare	Biogas combustion	260	South west
	CHP stack	Biogas combustion	250	South west
	Sludge handling	Sludge reception and distribution	50	West
	Sludge treatment plant	Sludge treatment	50	West
	Sludge storage tank	Sludge treatment	120	South west
Receptor 2 - Estate Agent (Workplace)	Digester	Sludge treatment	160	South west
	Centrifuge	Sludge treatment	130	South west
	Cake bay	Sludge treatment	115	West
	Gas bag holder	Biogas combustion	185	South west
	Flare	Biogas combustion	230	South west
	CHP stack	Biogas combustion	175	South west
	Sludge handling	Sludge reception and distribution	90	North west
	Sludge treatment plant	Sludge treatment	70	West
	Sludge storage tank	Sludge treatment	190	West
	Digester	Sludge treatment	170	West
Centrifuge	Sludge treatment	145	West	
Cake bay	Sludge treatment	150	North west	

Receptor	Nearest potential emission source to receptor	Process	Distance (m) from nearest potential emission source	Direction of receptor from closest emission source
	Gas bag holder	Biogas combustion	195	West
Receptor 3 – Residential property	Flare	Biogas combustion	220	South west
	CHP stack	Biogas combustion	160	South west
	Sludge handling	Sludge reception and distribution	95	South
	Sludge treatment plant	Sludge treatment	95	South
	Sludge storage tank	Sludge treatment	195	South
	Digester	Sludge treatment	180	South west
	Centrifuge	Sludge treatment	165	South
	Cake bay	Sludge treatment	65	South west
	Gas bag holder	Biogas combustion	190	South west
	Flare	Biogas combustion	260	South west
	CHP stack	Biogas combustion	250	South west
	Sludge handling	Sludge reception and distribution	50	West

Note: (a) Distance from source to receptor is rounded to the nearest 5m
(b) Sludge storage tank includes sludge reception tank, screened sludge storage tanks, thickening sludge storage tanks, thickened sludge storage tanks and post digestion storage tanks
Value in **bold** represents the nearest potential emission source for each process which is closest to a sensitive receptor

3.4. Odour modelling

The effectiveness of the pathway for odour impacts associated with the Sandown Wastewater Treatment Works has been assessed using wind data and the locations of the nearest sensitive receptors relative to the Site. Modelled wind data for the years 2018-2022 were derived for the site from an atmospheric hindcast model (Vortex).

The nearest high-sensitivity receptors to the Site are residential receptors located at Culver Way, which is approximately 420m east of the Site and residential receptors at E Yar Road, which are approximately 40m to south west of the Site. The nearest medium-sensitivity receptors to the Site are industrial receptors located between E Yar Road and Marsh Close, which are approximately 50m to south west of the Site and industrial receptors at E Yar Road, which are approximately 40m south west of the Site.

During 2018-2022, the residential receptors at Culver Way, industrial receptors between E Yar Road and Marsh Close, industrial receptors at E Yar Road, and residential receptors at E Yar Road were downwind of the Site approximately 31%, 26%, 23% and 21% of the time respectively. Based on the distance between these receptors and the Site and the frequencies of winds to disperse odours towards these receptors, the pathway for odour impacts from the Site to the receptors are considered to be moderately effective. It is considered that the potential for odour impacts from the site cannot be scoped out on the basis of this simple assessment.

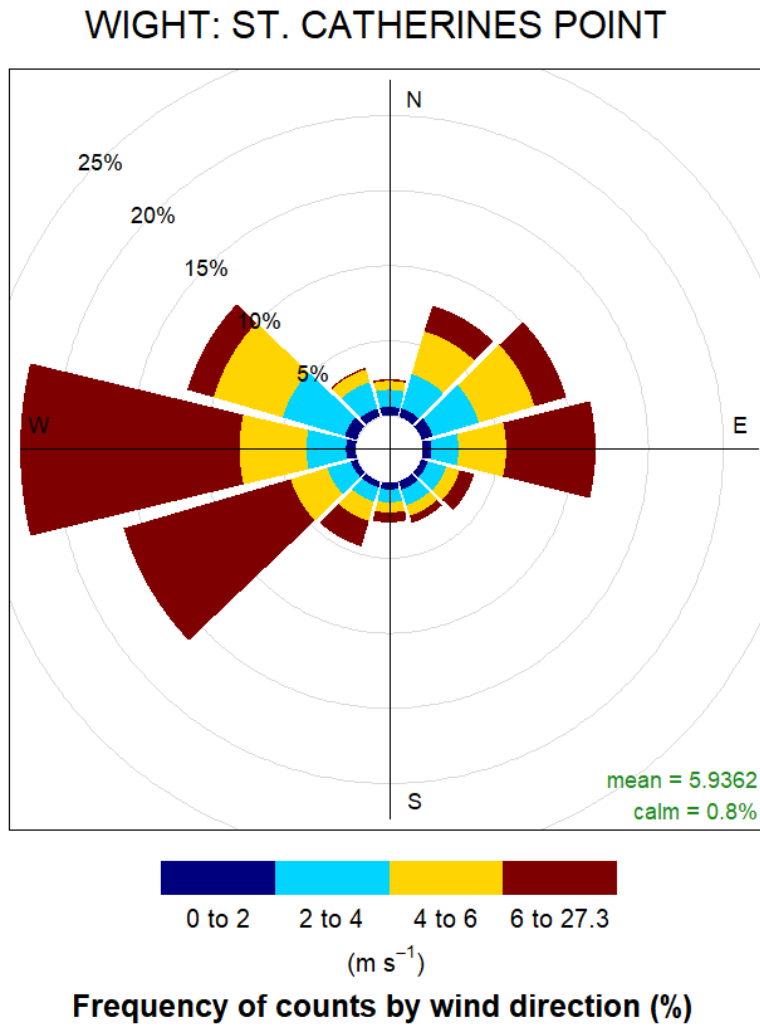
No specific odour modelling has been commissioned for this site and modelling has not been undertaken prior to this application, as the OMP consolidates existing odour control measures and will form part of the Operational Techniques. The Site does not meet the criteria for the listed suggestions for odour modelling according to the Environment Agency H4 guidance:

- To predict the impact of a new proposal:
The Site is an existing site and structural changes are not proposed as part of the application. The sources of odour and their controls are already known;
- To assist in the investigation of the cause of odour complaints:
The causes of odour were identified and resolved with no requirement for further investigation to establish significant changes in odour management;
- To compare the cost effectiveness of odour mitigation options:
Southern Water is not seeking, at the time of the Bespoke Installation Permit application, to implement additional odour mitigation measures that require capital investment;
- To work out emission limits for point source emissions:
The Site presents a low odour risk to sensitive receptors and an Odour Control System is in operation, which will be compliant with design standards or as specified in the Environmental Permit, see Section 5.7;
- To indicate how much improvement is needed or size abatement equipment: improvements to odour control is implemented through the OMP.
21 odour complaints have been received from 2018 to 2023. No further information is available on the description of complaints, actions taken or the timescale for rectification. **The complaints have not been confirmed as substantiated or relating to the STC.**
- To calculate a suitable chimney height to provide an acceptable exposure at receptors:
The chimney heights are fixed structures, and since the Site is low risk of odour, it is not justified to alter existing odour control structures.

The 2018-2022 wind rose for the nearby meteorological site, St. Catherine's Point (located approximately 14.3km south west of Sandown WTW), is shown in Figure 3. This monitoring site experiences strong prevailing winds from the west, with occasional strong winds from the east. However, this meteorological site is located on a headland while Sandown WTW is located within a bay and, therefore in addition, an atmospheric hindcast model (Vortex) has also been used to assess the wind conditions at the WTW.

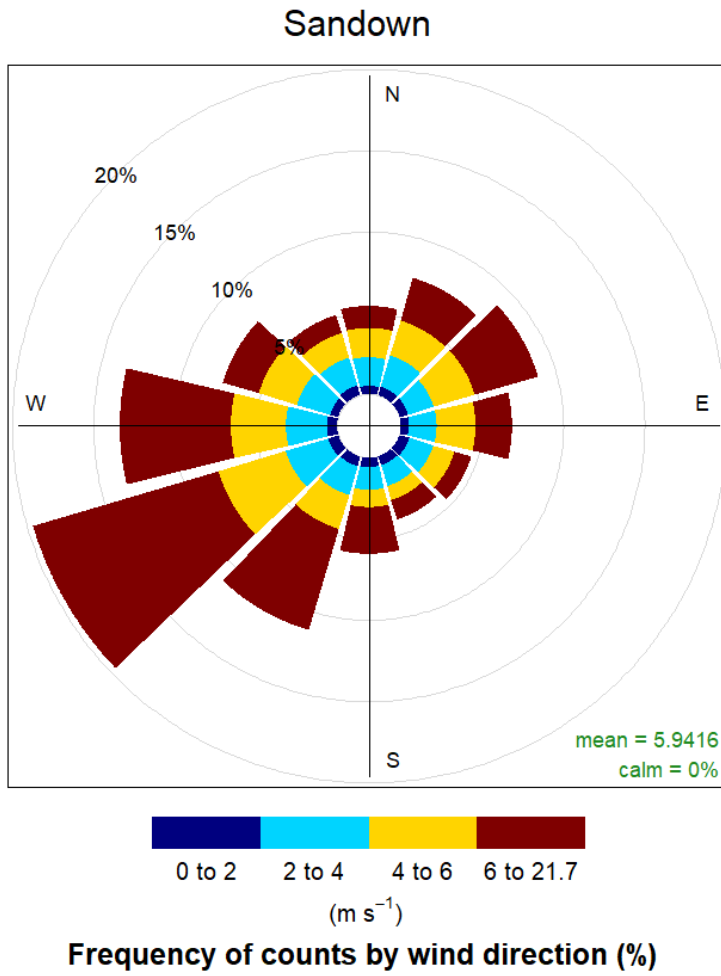
Figure 4 presents the wind rose generated for the Site from the Vortex model, for the period from 2018-2022. The wind rose demonstrates that historically this location experiences strong prevailing winds from the west and south west, with occasional gusts from the north east. This suggests that sensitive receptors located to the east of the Site would be at the greatest risk from bioaerosol emissions from the STC as they would be downwind of the prevailing wind direction.

Figure 3: Average wind rose for St. Catherine's Point meteorological site, 2018-2022



Source: NOAA Integrated Surface Database (ISD) (2023)

Figure 4: Average wind rose for the Site from the Vortex model, 2018-2022



Source: NOAA Integrated Surface Database (ISD) (2023)

4. Odour Management and Control

4.1. Odour control system

Sewage, sewage sludges and returned liquors can all contribute to odour on a STC. A number of potential odour release points/areas have been identified at Sandown STC, and a combination of good baseline site management and odour control measures have been implemented to manage these sources. All sources of odour identified at the Site have been either covered or enclosed within buildings and the air is extracted continuously to the odour treatment plant.

The majority of Site operations are fully enclosed and perimeter sprayers are used in certain operational areas of the Site. All sludge treatment processes are covered or enclosed. Odour is controlled via one current Odour Control Unit (OCU). This is equipped with carbon filters for air treatment and abatement to reduce odours and the generation of other gaseous compounds. The OCU treats air from the sludge treatment building and the sludge reception tank.

A two-stage chemical scrubbing plant is used at the STC to control odour from the sludge treatment building. The first stage consists of an acid scrubber to remove odorous basic compounds, such as ammonia, while the second stage consists of an alkali scrubber to remove acidic odorous compounds such as hydrogen sulphide. The system utilises sodium hypochloride and sodium hydroxide.

Separate ventilation systems are attached to the inlet works building, sludge building and sludge recirculation kiosk where air is extracted and treated by the OCU. Treated air is released to the atmosphere via stacks to assist dispersion.

Details of the monitoring carried out on the OCUs is outlined within this section and in Section 5.

The OCUs are monitored through SCADA 24/7, with duty operator instructed to investigate any alarms raised immediately. Trigger level information is not available. This will form part of the monitoring and reporting plan and include timescales for implementation of work required to remediate any identified gaps.

Odour is monitored in the cess and sludge import area via odour loggers. Other odour mitigation measures implemented on-site include placing covers on containers and limiting the height of rising sludge.

Perimeter sprayers are present and operational in certain areas of the Site and all waste is imported in covered lorries or contained in tankers.

Leak detection (methane gas analyser) is installed on biogas holder/s to ensure any leaks from the inner bag are detected. Any leaks detected on the biogas system would always be fixed immediately by Southern Water due to the process safety risk of posed by biogas.

The removal of biosolids off-site will be undertaken as soon as practically possible whilst considering prevailing weather conditions.

A process flow diagram showing which assets are covered by the OCU can be found in Appendix B.

Odour control checklists can be found in Appendix D.

4.2. Odour control in normal and abnormal conditions

All operating practices must be compliant with the Site's O&M manuals, Southern Water company practices and management systems and the OMP. Routine and non-routine activities are reviewed for their impact upon the potential for odour generation in line with Southern Water's EMS.

In order to achieve overall odour containment and minimise unplanned releases of odour to atmosphere, it is essential that;

- The integrity of all covers over process units is maintained continuously, other than during periods of essential maintenance.
- All doors in buildings ventilated to the odour control system remain closed except when access is required and that the integrity of the buildings fabric is ensured.
- Imports of pre-digested cake are to be offloaded within buildings with closed doors and Odour Control Unit extraction operating, where available.
- Any imports to the head of works to be undertaken as quickly as possible to limit odour emissions. Additional imports to head of works are on an emergency basis, for example if a pumping station goes down or there is a burst rising main, the waste would be transferred via tanker to the head of works and only from assets that would already discharge to the Site (indigenous).

Where routine, planned and emergency maintenance of plant items has to be carried out and there is a high risk of odour being released to atmosphere, in quantities sufficient to result in detection off-site, a detailed risk assessment of the activity is conducted, as part of which issues of odour generation, release and control are considered. Where the risk of an off-site odour event occurring is judged to be high, the Southern Water Customer Services call centre will be informed, together with the Environment Agency.

4.2.1. Normal conditions

There will be regular occasions throughout the year when routine, planned and reactive maintenance are carried out in order to ensure continued optimum operation of wastewater treatment and sludge recycling. Routine and planned maintenance tasks are divided into different classifications according to the level of complexity, speciality and frequency. The classifications are:

- Routine Operations: the daily and weekly routine operations are scheduled regionally through weekly and quarterly programmes of work. Site operators are responsible for carrying out the tasks and the Field Performance Manager (FPM) for checking completion and quality.
- Planned Maintenance (Ellipse): the programmes for planned maintenance are generated regionally. Jobs are sent direct to qualified mechanical or electrical technicians via electronic communication. Start and completion of tasks, including work done, are logged direct to Ellipse, which produces records of plant performance. Site and regional mechanical and electrical staff, in conjunction with specialist contractors, are responsible for carrying out the tasks and the FPM for checking completion and quality.
- Contractor Maintenance (CM): the programmes for planned maintenance of some categories of specialist equipment (centrifuges, odour control equipment, odour control monitoring equipment, etc.) are generated regionally. Paper records of work carried out, completion and approval are kept on-site and by the Supply Agreement Leader.
- Local Plant Monitoring (LPS): Specific monitoring (for example, hydrogen sulphide at some sites) is carried out by online instrumentation. Information is recorded on SCADA. The plant records (daily plant spreadsheet) are created by site operators and process scientists. Site operations staff are responsible for carrying out the tasks and FPMs for checking completion and quality.
- Contractors Records (CR): Records of sludge deliveries are recorded in real time on-site via an electronic logging system and reported monthly. Records are available via online database.

- **Material Delivery and Removal:** Records of sludge deliveries are recorded electronically in real time. Chemical delivery records are maintained on-site logs. Bulk chemical deliveries and consumption are also recorded on SCADA in real time.

Minor repairs and routine maintenance works are carried out continuously throughout the year during the working day, avoiding evenings and weekends, except in emergencies. Where possible, more major maintenance tasks are carried out in a planned manner according to priority and resources. Odour sensitive major maintenance tasks will be aimed to be undertaken during the winter period (between October and April), where appropriate. The emphasis in planning this maintenance is to minimise the time required to carry out the work, ensuring as far as possible, that odours are contained or abated during the work and to deploy alternative odour suppression systems, if required.

Where a maintenance operation is likely to release quantities of odour likely to be detectable off-site, the relevant authorities and the Southern Water Regional Call Centre would be informed in advance.

The OCU maintenance report can be referred to for more detailed actions required on site (Appendix E).

Table 4 highlights the typical maintenance activities for the wastewater and sludge treatment processes.

Table 4: Typical maintenance for sludge treatment activities

Process	Period	Typical maintenance activities
Preliminary treatment	Daily	Checks on plant and equipment as per operating plan.
	2-3 times / week	Removal of grit/screening skips.
	Weekly	Operational checks on screens, compactors, and associated equipment as per operating plan.
	Monthly	Checks by mechanical/electrical (M&E) engineers as per regional maintenance schedules.
	Annually	Maintenance of plant and equipment.
Primary Treatment	Annually	Drain-down of and repairs to the tanks.
Secondary Treatment	Daily	SCADA and Visual checks by operations personnel, checks of dissolved oxygen and bubble pattern along with daily sampling.
	Weekly	Clean and check dissolved oxygen probes.
	Dictated by operational performance	Drain and clean lane, replace failed diffuser membranes.
Sludge Import	Ad-hoc	Regular checks on deliveries and operation of exhaust extraction and ventilation, removal of skips from sludge and cess screens.
	Weekly	Routine checks on equipment. Tasks carried out and records maintained under the Site operating and monitoring plan.
	Monthly	Checks by M&E. Tasks carried out and records maintained under regional maintenance schedules.

Process	Period	Typical maintenance activities
	Annually	Checks by M&E. Tasks carried out and records maintained under regional maintenance schedules.
Sludge Storage	Daily	Monitoring of levels. Tasks carried out and records maintained under the Site operating and monitoring plan.
	Weekly	Visual inspection of plant & equipment. Tasks carried out and records maintained under the Site operating and monitoring plan.
	Dictated by operational performance	As required drain down and clean tank, inspect structure. Tasks carried out and records maintained under regional maintenance schedules.
Sludge Thickening	Daily	Routine daily checks.
	Weekly	Routine weekly checks and maintenance.
	Monthly	Maintain and adjust plant to maintain efficiency.
	Annually	Checks by M&E as per regional maintenance schedules.
Digester and post-digestion storage tanks	Daily	Feed Volume, Temperature, Dry solids Test, and Visual Inspections (levels and Equipment) monitoring.
	Monthly	Checks of pressure relief valves and plant. Routine maintenance of systems.
	Annually	Checks and service of gas systems.
Centrifuge	Daily	Centrifuge check routine as advised by supplier.
	Weekly	Centrifuge check routine as advised by supplier.
	Monthly	Checked in line with routine service agreement by appointed service provider.
	Annually	Checked/Service every six months by appointed service provider.
Odour control units	Daily	Routine daily checks.
	Weekly	Inspection and maintenance routines in accordance with both the frequency and task specified in the regional maintenance schedules.
	Monthly	Inspection and maintenance routines in accordance with both the frequency and task specified in the regional maintenance schedules (including monitoring of pressure, flow rate for both gas and liquid, the pH/ OPR of scrubbing liquid, inlet gas temperature, pressure differential, inlet gas moisture content, and leak check monitoring)
	Annually	Annual service by the Odour control service provider in line with contracted maintenance requirements, including checks on the gas pipes of the scrubber and cleaning of the nozzle of liquid feeding system and demisters

Diffuse emissions from open storage areas, mainly the cake bays, are minimised by:

- Minimising the volume of sludge cake being stored to eliminate the risk of cake overspilling

- The sludge cake not being handled once in the cake bay, (unless liming is required, however, this requires minimal handling) until it is being removed from site;
- All sludge cake being exported is transported in covered lorries.

To minimise odour nuisance, it is important to ensure that the Sandown STC is operating as designed. Covers and hatches are replaced to maintain the integrity of enclosures provided to collect odorous air.

4.2.2. Odour risk assessment

Unless it is in an emergency situation, an odour risk assessment will be undertaken before carrying out maintenance tasks with high odour risk and high odour sensitivity. Examples of such activities are:

- Shutdown of odour control systems for an extended period for maintenance
- Non-routine draining down of large open process tanks with potential to generate odour
- Lifting of odour control covers, opening of hatches or keeping doors of odour-controlled building open for an extended period
- Commissioning of new odour sensitive processes or equipment where odour risk may not be adequately mitigated
- Significant flow diversion outside odour-controlled processes for an extended period

A flowchart to identify when an activity requires a separate odour risk assessment is provided in Appendix F.

An odour risk assessment matrix will be used to determine the odour risk for planned and unplanned maintenance work commonly performed. Where an unusual activity not contained in the matrix is planned, a site-specific risk assessment will be carried out according to a standard procedure. The matrix also includes foreseeable situations for emergency breakdown and situations arising as a result of dealing with an emergency where the ability to improve control of or minimise odorous release is compromised. The advice given by the odour risk assessment matrix will be followed, as appropriate, taking into account site conditions.

Table 5 provides an example of a risk assessment for routine maintenance operations. The risk assessments are reviewed and updated at least annually. The key contact group (the Environment Agency and Southern Water Customer Services) will be informed for high-risk activities, in relation to odour, at least 3 days before work is due to commence.

Southern Water's Regional Control Centre (RCC) will be informed in advance of the nature and duration of maintenance work and measures to be undertaken when a significant odour risk is identified from the Odour Risk Assessment.

Table 5: Example of risk assessment for routine maintenance operations

Event	Implications	Odour Risk (High, Medium, Low)	Proactive Actions	Responsive Actions
Maintenance of processes within WTW	Opening of hatches, and exposure of process units to building.	Low	Processes contained with WTW which itself is odour controlled.	Minimise number of hatches open at any one time.
Maintenance on sludge treatment process (not biogas system)	Potential for odour release if any sludge exposed to atmosphere.	High	Divert or minimise sludge throughput in process area.	Carry out during winter months where possible, if required during summer use portable odour reduction sprays.
Maintenance on odour control system	Reduced capacity for period of maintenance risk of odour release if input peaks received	Medium	Control processes to minimise risk of high peaks of H ₂ S reaching odour control unit.	Carry out during winter months where possible, if required during summer assess need to use portable odour reduction sprays.

4.2.3. Abnormal conditions

There will also be unanticipated breakdowns of equipment which require unplanned and emergency maintenance. During periods of abnormal conditions, the normal odour standard and emission standards may not be able to be fully complied with, and/or there may be fugitive emissions of odour from parts of the Site where there are normally none. An agreement from Environment Agency Local Area Officers may be required for these operations.

In the event of plant failures or emergency situations, this would raise an alarm on the Site's SCADA or telemetry systems, which will be reacted to by on-site or regional control room operators and FPM.

Depending upon the nature of the fault or emergency, a mechanical or electrical technician, both of whom are on-call 24 hours, would be contacted and will attend the Site as soon as practicable if required. Where the on-call technicians are already engaged upon other response work, there is the facility to access staff from other Southern Water geographic divisions, coordinated by the FPM. All faults, breakdowns and emergencies are logged electronically together with records of the action taken and the solutions reached.

If any waste arrives on-site that fails to provide correctly completed paperwork this is immediately reported to the Industrial Waste Services Team, who will decide if it can be accepted or rejected. Waste arriving at Site is quarantined in any of the following circumstances:

- Hazard Analysis Critical Control Point (HACCP) critical limit breach
- Maximum Acceptable Concentration (MAC) sample failure
- Measured cake DS% on-site has dropped below 20% (the 20% has to be confirmed by 2nd sample)

If any of these take place, then material will need to be quarantined in line with the Biosolids Assurance Scheme procedures.

If quarantining is required, then the quarantined digested material is placed in an empty bay on site if available, or in an empty bay at the Fairlee Road WTW. If a storage bay is not available, then the Biosolids Compliance Team should be contacted to arrange alternative storage.

When the breach is HACCP or MAC failure related the cake will be held at the quarantine location until compliant results are received from the lab provider. After bacti compliance is confirmed the relevant stakeholders will be notified by a certificate of compliance that cake from the site in question can be recycled to land.

When the breach is related to DS% content of the cake being below 20%, then the affected cake will be held in quarantine until alternative treatment or disposal can be arranged by SWS.

If waste does not meet the specific pH limits, on sampling and testing, in the Environmental Permit, then further advice is sought from the Industrial Waste Services Team, who will decide if it can be accepted or rejected. If rejected, then the Waste Rejection and Incident Note is completed, and the load is turned away.

Table 6 provides an example of a risk assessment for abnormal and emergency operations, which is reviewed and updated as required. The key contact group (the Environment Agency and Southern Water Customer Services) is informed, for high-risk activities, relating to odour, as soon as event occurs.

Table 6: Risk Assessment for Emergencies and Abnormal Operating Conditions

Event	Potential source of odour	Potential impacts	Odour risk	Measures to prevent or minimise risk	Actions to be taken
Breach of odour-controlled area (excluding sludge containing structures)	Untreated air	Effectiveness of foul air extract system compromised, risk of odour release until repairs completed	Medium	Minimise odour generating activities in area	Temporary containment pending full repair Ensure any interconnecting doors etc secure Minimise odour generating activities in area Assess odour impact with local survey, use portable odour reduction sprays if requirement identified
Breach of odour-controlled area sludge containing structure	Untreated air	Effectiveness of foul air extract system compromised, risk of odour release until repairs completed	High	Review sludge handling operations divert or minimise for duration of breach	Minimise area exposed to atmosphere and surround with portable odour sprays as appropriate

Sandown STC
 Odour Management Plan

Event	Potential source of odour	Potential impacts	Odour risk	Measures to prevent or minimise risk	Actions to be taken
Breach of biogas system/ loss of biogas containment	Leaks from membrane	<p>Uncontrolled release of biogas, risk of odour release until repairs completed</p> <p>Double membrane system with gas pressure between the membranes regulated and monitored</p> <p>Methane detectors operated with alarms to alert operators of any leakage</p>	High	Minimise activities for duration of containment loss	<p>Minimise sludge processing, divert to controlled release point via the combined vacuum and pressure release valve</p> <p>Surround with portable odour sprays as appropriate</p> <p>Diversion of biogas to CHP plant or Waste Gas Burner</p> <p>Inspection maintenance and repairs as appropriate</p> <p>Record details and actions taken in site diary</p> <p>Report to the Environment Agency</p> <p>Emergency response from gas maintenance contractor</p>

Sandown STC
Odour Management Plan

Event	Potential source of odour	Potential impacts	Odour risk	Measures to prevent or minimise risk	Actions to be taken
Failure of odour control plant	Untreated air	High risk of release of abnormal operational odours direct to atmosphere until repaired	High	Routine maintenance Regular monitoring of equipment performance Duty standby functionality Standby capacity in the media beds Emergency call to odour system maintenance contractor Control processes to minimise risk of high peaks of H ₂ S reaching odour control unit Design provides for degree of redundancy	Assess need to use portable odour reduction sprays Investigate and repair
Spillage of sludge on-site	Liquid sludge	High risk of odour until cleaned up Low volume spillage likely to go directly to drain which returns to the WTW for treatment	High	Regular site inspections and monitoring the system through SCADA to detect any spills Priority to clean up as and when detected Pipe work and tanks undergo regular inspections Planned maintenance on equipment	Stop source of spill and immediately wash down area Repair or bypass if possible. If incident prolonged use portable odour sprays until cleared. Record spillage and actions taken in site diary
Sludge thickeners	Sewage sludge	Thickeners are enclosed and air extracted to the OCU	Medium	Sludge dosed with polymer as required	

Sandown STC
Odour Management Plan

Event	Potential source of odour	Potential impacts	Odour risk	Measures to prevent or minimise risk	Actions to be taken
High pressure conditions in digesters	Release from Pressure Relief Valve	Biogas would be vented at high pressure to aid dispersion	Medium	Gas pressure is regulated and monitored	Diversion of biogas to Gas Burner Record details and actions taken in site diary
High pressure conditions in biogas holder	Release from Pressure Relief Valve	Biogas would be vented at high pressure to aid dispersion	Medium	Gas pressure is regulated and monitored	Diversion of biogas to Gas Burner Record details and actions taken in site diary
Sludge reception unit roller shutter door failure	Release from behind the shutter door in sludge reception	Effectiveness of odour control measures compromised, risk of odour release until repairs completed	Medium	Minimise sludge reception activities until repairs have been completed	Record details and actions taken in site diary
Failure of treatment process	Release from untreated sludge	Risk of odour from incomplete biological treatment until plant recovery achieved	Medium	Process monitoring and having closed covers. Immediate involvement of process support team to identify cause of process failure and aid recovery	Assess need to use portable odour sprays spread around process unit
Prolonged hot and dry periods	High strength / septic sludge	Potential for septicity to develop throughout the works Issues with temperature sensitive components	High	Increased monitoring. Planned maintenance on equipment	Record details and actions taken in site diary

Sandown STC
Odour Management Plan

Event	Potential source of odour	Potential impacts	Odour risk	Measures to prevent or minimise risk	Actions to be taken
Very high rainfall	Flooding causing failure of odour control equipment	Flooding on-site causing failure of equipment	Low	Increased monitoring. Installing new equipment above water levels, if known to be an issue on-site Planned maintenance on equipment	Check the performance of the Odour Control Unit when water levels drop and replace media as required (if media has been flooded it may need replacing)

5. Monitoring

5.1. Routine site observation monitoring

As part of the general operation of the Site, control room operators monitor the SCADA outputs on a routine basis, in order to ensure that individual process units on and off the Site are performing within specification. In the event of an out-of-specification plant item or an alarm being initiated, appropriate remedial actions would be instigated, and this is dealt with in subsequent sub-sections.

In the event that an out-of-specification plant item is operating beyond normal operating ranges, the process parameters are outside optimum, or any other alarm being initiated, appropriate remedial actions would be instigated. Operatives will follow the Awareness Raising Instruction in Appendix A, and further measures are dealt with in subsequent sub-sections.

Any odour detected on-site during normal operation will be rectified using measures described in Table 6 to implement the actions and prevention protocol. Routine sniff tests at the potential odour sources listed in Table 1 are in place to proactively mitigate odour reaching and exceeding the site boundary. If detected, investigation into odour source is undertaken and contingency measures listed in Table 6 are implemented. Temporary use of odour suppression system (spray) is available to be operated while contingency measures are being prepared.

Site personnel periodically assess the performance of odour containment and extraction systems utilising specialist equipment (such as but not limited to Optical Gas Imaging) to compare actual vs. designed air changes per hour, or to identify leakage points on systems. Any issues identified will be addressed and then a re-assessment performed to confirm issue resolution.

5.1.1. General duties

Operators shall carry out routine duties according to the relevant operational and maintenance schedules and procedures to ensure effective operation of plants. Specific tasks include:

- Perform daily, weekly and monthly maintenance tasks as scheduled
- Make regular observation of critical processes and equipment including odour sensitive and odour control systems
- Carry out routine performance tests and recording
- Order and take deliveries of chemicals and other consumables
- Report performance issues or equipment problems promptly to Process Scientists, Mechanical & Electrical (M&E) technicians, Instrumentation, Control & Automation (ICA) technicians or Specialist Contractors as appropriate.

5.1.2. Duties for odour control

Operators shall carry out the following tasks:

- Undertake and record any inspections in the site diary, along with any actions undertaken
- Investigate odour complaints following the Complaints Procedure as shown in Appendix G
- Record actions taken in respect of odour investigations
- Conduct weekly sniff tests
- Record and report incidents that caused significant odorous emission, and follow the Awareness Raising Instruction in Appendix A
- Produce other records as required by the OMP

- Undertake the Site odour monitoring and controls listed in Table 7

Drivers delivering odorous loads shall carry out the following tasks:

- Ensure loads are sealed and covered when arriving the Site and approaching the sludge reception.
- Remove covers only once within the sludge reception building with the doors closed.
- Follow the spillage management procedures set out in section 5.1.6 if odour materials are spilled.
- Ensure that any wastes that are not authorised to be accepted do not enter the Site (as referred to in the Duty of Care procedure).

Table 7: Site odour monitoring and detection processes

Potential Odour Source	Routine Actions Required	Risk pre-control measures	Monitoring Frequency	Attention Level	Action level	Preventative Action	Risk post-control measures
Raw sludge reception	Avoid excessive turbulence Ensure doors are closed before discharging or unloading Connect foul air exhaust to hose before loading Ensure vehicles cleaned after loading/unloading. Hose down any spillage after each load/unload Clean contaminated wheels before leaving Site. Doors closed after unloading/discharging	Medium	Every site visit	Investigate unusual and/or excessive odours	Follow the Awareness Raising Instruction, Appendix A	Stringent loading and unloading procedures. Extracted air from the tanker loading area is treated by odour control unit. If necessary, implement special odour mitigation measures to reduce the risk of odour nuisance. Make contractor aware of requirements in OMP.	Low
Transportation	Ensure only sealed or covered skips/trailers used. No removal of covers whilst parked waiting to load/unload Monitor odours during cake loading	Medium	Daily	Investigate unusual odours	Follow the Awareness Raising Instruction, Appendix A	If necessary, implement special odour mitigation measures to reduce the risk of odour nuisance. Make contractor aware of requirements in OMP	Low

Sandown STC

Odour Management Plan

Potential Odour Source	Routine Actions Required	Risk pre-control measures	Monitoring Frequency	Attention Level	Action level	Preventative Action	Risk post-control measures
Cake storage/loading area	Ensure vehicles cleaned after loading/unloading. Hose down any spillage after each load/unload Clean contaminated wheels before leaving Site.	Low	Daily	Stringent loading and unloading procedures. If necessary, implement special odour mitigation measures to reduce the risk of odour nuisance. Make contractor aware of requirements in OMP.	Investigate unusual odours	Noticeable odour from the cake storage area and/or complaint received. Follow the investigation guidance outlined in Appendix G	Very Low
Sludge holding tanks	Minimising retention time Monitor odour levels around tank	Medium	Every site visit	Increased odour from tank	Noticeable odour from tank Follow the Awareness Raising Instruction, Appendix A	Increase sludge treatment rate to reduce retention Hose spillage's Increase de-sludge ops up stream Run odour masking system (Short term)	Low

Sandown STC

Odour Management Plan

Potential Odour Source	Routine Actions Required	Risk pre-control measures	Monitoring Frequency	Attention Level	Action level	Preventative Action	Risk post-control measures
Sludge thickening/ blending	<p>Minimise retention prior to thickening, dewatering or digestion;</p> <p>Discharge sludges and liquors, including imported sludges, to covered tanks, with displaced air passed through an Odour Control Units;</p> <p>Prevention of sludge accumulation in off-line tanks; and</p> <p>Proactive identification of potential problems and tankering of sludges to other sites with odour abatement.</p>	Medium	Daily	Increased odours from area	<p>Noticeable odour from area and/or complaint received</p> <p>Follow the Awareness Raising Instruction, Appendix A</p>	<p>Process is undertaken in an enclosed building with appropriate odour abatement</p>	Low
Secondary Digesters	<p>Check for strong and uncharacteristic odours</p>	Low	Daily	Investigate unusual odours	<p>Investigate and report strong/ unusual odours to FPM and Scientist</p> <p>Follow the Awareness Raising Instruction, Appendix A</p>	<p>Planned preventative maintenance undertaken on equipment. If necessary, implement special odour mitigation measures to reduce the risk of odour nuisance.</p>	Low

Sandown STC
Odour Management Plan

Potential Odour Source	Routine Actions Required	Risk pre-control measures	Monitoring Frequency	Attention Level	Action level	Preventative Action	Risk post-control measures
Centrifuge	Check for strong and uncharacteristic odours	Low	Every site visit	Investigate unusual odours	Investigate and report strong/unusual odours to FPM and Scientist Follow the Awareness Raising Instruction, Appendix A	Regular checks and investigative action	Low
	Check polymer dosing	Low	Weekly	Polymer dosing rates exceeds set limits	Polymer dosing exceeds upper or lower threshold limits Follow the Awareness Raising Instruction, Appendix A	Take remedial action to return polymer dosing to correct rate	Low
Gas Flare Stacks	Complete biogas combustion should give clean emissions with blue or non-visible flame	Low	Weekly	Occasional orange flame or black smoke visible	Constant orange flame or black smoke visible Follow the Awareness Raising Instruction, Appendix A	Routine M&E checks or maintenance to clean nozzles of carbon build-up	Low

Sandown STC

Odour Management Plan

Potential Odour Source	Routine Actions Required	Risk pre-control measures	Monitoring Frequency	Attention Level	Action level	Preventative Action	Risk post-control measures
Skip conveyer feed gates	Visual check to ensure skips not over filling	Low	Every visit		Follow the Awareness Raising Instruction, Appendix A	Engage M&E to rectify if malfunctioning	Low
Whessoe valves on digesters	Check they are clear from foam residue	Low	Daily	Investigate unusual odours and gas detection	Not seating correctly Follow the Awareness Raising Instruction, Appendix A	Engage service contractor to resolve any problems	Very low
OCU	Check pH Check media condition	Medium	Daily	pH>3 Sudden drop in performance	pH >3 Sudden drop in performance Follow the Awareness Raising Instruction, Appendix A	Ensure media damp Change media as per schedule These are process monitored and planned preventative maintenance is regularly undertaken on equipment.	Low
Whole site	Doors to operational buildings will remain closed and hatches will be latch closed.	Medium	Daily	Increased odours	Noticeable odour from area and/or complaint received. Follow the Awareness Raising Instruction, Appendix A	Doors and hatches will only be opened for minimum periods while access is required for planned operational and maintenance activities.	Low

5.1.3. Visual and olfactory inspections

There will be a daily walkover survey incorporating a “sniff-test”. Sniff testing will be undertaken at the security fence boundary, starting at an upwind location. Where possible, the sniff testing will be carried out by a person who is not accustomed to the odour generated by on-site activities i.e. a person who has recently entered the Site boundary such as an FPM.

During each walkover, the person undertaking the “sniff-test” must stand nearby to each potential source of odour identified in Table 1 and at least one location for the north, south, east and west of the site boundary (as close to the perimeter as practicable) and note on a map the location of the perimeter checks. Checks in each location should be undertaken for at least 20 seconds and the monitoring form completed, see Appendix H.

During this walkover, over a period of approximately 30 minutes, perceptive “sniff-testing” of the ambient atmosphere is conducted and observations are recorded on a daily check sheet. If odour is likely to exceed the site boundary and, therefore, has potential to cause a complaint, the procedure in Appendix A will be followed.

The results of the sniff test will be recorded in the site diary or an appropriate form. Sniff testing is designed to detect any abnormal plant odour emissions. In addition, it is important to document any potential contribution from other off-site sources of potential odour nuisance located outside of the facility boundary.

In the event that abnormal plant odour is detected, the source of the odour will be investigated, as appropriate, and remedial action taken, as necessary, following measures addressed in the OMP. The approximate extent of the downwind odour will be established to determine whether this reaches the downwind post and rail fence boundary. During maintenance and/or emergency conditions which are likely to result in release of odours, the frequency of “sniff-testing” will be increased to twice daily, or more frequently as appropriate.

Actions for remediation will be assigned by the FPM following the issue of an odour record. Once actions are completed, additional sniff tests of at least once a day for minimum three days at the source of the odour will be carried out to determine whether further actions are required. Whereby odour is no longer detected the record will be closed. If odour remains the OMP and maintenance records will be reviewed to determine alternative actions to be taken, this process will continue until the odour issue is no longer on-going.

5.1.4. Housekeeping

Good housekeeping improves efficiency, creates a pleasant environment to work within and makes the Site less likely to cause odour nuisance. Operators have a responsibility to keep sites clean and tidy. The “Top 10 Tips to Minimise Odour Impact” will be communicated to the Site.

- Ensure that your odour control plants are fully operational and maintained
- Keep all doors and hatches latch closed at all times to contain odour
- Clean up debris / spillages as soon as practicable
- Monitor sludge levels within primary treatment to avoid septicity
- Hose down and clean process tanks / channels after draining
- Monitor digesters / Whessoe valves and gas flares
- Report any odour activity caused by Contractors to your Senior Manager
- Where possible, don't undertake odour sensitive work if it cannot be completed before or continued during the weekend

- Follow business procedures and respond to all odour complaints
- If you See it, Smell it, do something about it (Don't Ignore It)

Additional reminder signs will be displayed in prominent positions at the Site where open doors, covers and skips present an odour risk and include:

- Keep all doors shut
- Keep all covers / lids latch closed
- Clean up spills immediately using disinfectant, if required
- Monitor odour control systems
- All rubbish / waste to be disposed of immediately to relevant skip.

5.1.5. Meteorological observations

Southern Water will record daily in the site diary the following meteorological data:

- Air temperature
- Relative Humidity
- Wind Direction
- Wind Speed
- Rainfall

Meteorological data will be reviewed in advance of activities that may present an odour concern, such as movement of sludge cake, to consider suitable measures to reduce or limit odour. For example, time such activities when wind speed is low (if possible).

Meteorological data will also be available to complete odour records to establish potential trends.

5.1.6. Spillage management

All staff on-site have a responsibility to maintain good housekeeping and clear spillages at the earliest opportunity to prevent odour. If a spillage occurs from a process, operators will carry out a clean-up as soon as possible (using disinfectant, where necessary). If a spillage is caused by a lorry or tanker, the driver is responsible to clean up before leaving Site. If a lorry or tanker left a spillage behind, operators will log and report any incident observed. The driver or company involved will be asked to return to the Site immediately to clean up. Significant spillage incidents will be recorded in the site diary.

Key areas at risk from spillage (and the control measures):

Sludge reception area

- Tanker drivers responsible for cleaning up spillages after every load. Hose is supplied

Cake bay area

- Drivers are responsible for cleaning up spillages after every load.

Inlet works

- Spillages around the inlet area must be cleaned up immediately after spillage

Digester

- Anti-foam used to suppress foaming of sludge within the digester or dewatering process.

Entire site

- Routine site inspections by FPM and site manager – a minimum of once per month

5.1.7. Accident management

The Site operates under a site-specific Accident Management Plan, and associated Site Emergency Incident Plan, to prevent and manage environmental related accidents. The site-specific AMP (790101_MSD_AMP_SAN December 2023) includes a description of nominated key personnel and their responsibilities, emergency response procedures, contact details of internal contacts (Works Manager, Team Leader, Process Technician, Regional Control staff and key H&S staff), national and regional (where appropriate) contact details of emergency services and environmental regulators.

The AMP is distributed to key staff, to supervise the implementation of the Plan, and shared with external contacts (emergency services and the Environment Agency). The AMP is accompanied by a site plan that identifies the locations of designated storage areas (e.g. for chemicals, flammable compounds, bottled gas etc), spill kits, firefighting equipment, site entrances and access routes, gas bags and gas pipeline routes, gas isolation valves, major electrical equipment and possible isolation points, and other significant plant items.

Other key procedures relating to environmental accidents and incident management is set out in Southern Water's ISO14001 accredited Environmental Management System (EMS).

The relevant procedures in the EMS relating to environmental accident and incident management includes:

- EMS234 – Chemical and oil storage
- EMS240 – Nuisance management
- EMS260 – Pollution prevention
- EMS275 – Emissions to air
- EMS308 – Site housekeeping checklist
- EMS340 – Nuisance management procedure
- EMS341 – Air quality/odour management procedure
- EMS360 – Pollution prevention procedure
- EMS363 – Procedure for managing oil spills on sites
- EMS364 – Lime spill management
- EMS381 – Operational waste procedure
- EMS387 – Procedure for the acceptance of tankered commercial waste
- EMS388 – Waste permit breaches and near miss reporting procedure

5.2. Monitoring of the odour abatement system

Table 8 identifies the parameters and monitoring requirements in relation to the odour control system that needs to be undertaken at the Site.

Table 8: Parameters and monitoring requirements in relation to the odour control system to be undertaken at the Site

Emission point type	Parameter	Monitoring frequency	Monitoring standard or method
Channelled emissions to air (scrubbing system)	Hydrogen chloride	Once every 6 months	As per design and manufacturer's specifications Southern Water are to initially undertake characterisation of emissions from the odour control units, in line with BAT 3, to demonstrate if TVOC and HCl are present in the waste gas stream. If TVOC and HCl are identified as relevant in the waste gas streams Southern Water will monitor these emissions in line with BAT requirements and the Environmental Permit.
	TVOC	Once every 6 months	
	Ammonia	Once every 6 months	As per design and manufacturer's specifications
	H ₂ S	Once every 6 months	Maintenance undertaken by service provider, or otherwise as specified in the Environmental Permit
	Efficiency checks	Annual	Maintenance undertaken by service provider, or otherwise as specified in the Environmental Permit
	Gas stream flow	Continuous	As per design and manufacturer's specifications and SCADA, or otherwise as specified in the Environmental Permit
	Overall operation, including air circulation	Daily	Visual assessment or otherwise as specified in the Environmental Permit

Monthly service visits for the OCU's are undertaken by a contractor (currently ERG). A service visit report is issued after each visit which identifies priority actions required, other faults and comments as well as condition monitoring and observations. A copy of the latest site visit report (November 2023) is presented in Appendix E.

6. Training

6.1. Staff training

Southern Water provides a comprehensive programme of Health and Safety and operational awareness training, which is carried out for new starters and as an ongoing programme of refresher courses.

All new starters receive a comprehensive programme of health and safety training and on-going refresher courses. All staff receive training to cover operations at the Site. On the job training is provided to all staff through a rolling training programme.

Southern Water has developed its own Competency Management System (CMS), which identifies the training required for different roles on site.

Training on the following technical subjects relevant to odour control will be provided to operational staff according to needs and site requirements:

- Wastewater treatment processes
- Sludge treatment processes
- Checks for odour control equipment
- Risk assessment of odour sensitive maintenance activities
- Deployment of temporary odour control measures, for sites where these are present
- Site requirements in relation to the Odour Management Plan

The training needs of each individual are assessed during personal performance appraisal and reviews.

Formalised training for all grades of staff on the Site is undertaken relevant to job role. All staff are made fully aware of the need to be constantly vigilant with regard to Site odour control and management procedures.

Records for training received by all staff are held electronically. Records of environmental training are kept in the Southern Water EMS.

Relevant components of the OMP should form part of the induction process for all Site staff and contractors, to ensure they are aware of the procedures and responsibilities in relation to odour.

7. Communication

The objective of communication in odour management is to raise the profile and awareness of the importance of odour control and to keep stakeholders informed of odour incidents, and management practices. Appendix A provides an example of an awareness raising instruction.

7.1. Internal communication

Odour control will be regularly included by FPMs as an agenda item for team meetings.

Statistics of odour complaints and progress of actions to address odour issues will be updated monthly and communicated to Wastewater and Network Area Managers and other key personnel with odour management responsibilities.

7.2. External communication

Southern Water is committed to working closely with stakeholders to achieve sustainable reduction of odour nuisance. Southern Water is committed to making available relevant records and information to regulatory and local stakeholders, where appropriate, and communicating and engaging, in advance, with stakeholders where appropriate, any relevant activities that may generate odours.

7.3. Reporting

Southern Water will send all reports and notifications required by the Environmental Permit, or upon request by the Environment Agency, within the given timescales.

7.4. Complaints management and resolution procedure

All customer complaints about odour are entered on the Southern Water Customer Services Management System (CSMS), the details of which are detailed in Appendix G.

8. Reviews and Auditing

8.1. Reviews

8.1.1. Periodic reviews

A review of this OMP will be carried out by the FPM annually, unless agreed otherwise, and in accordance with the Environment Agency's H4 guidance (or current existing guidance should this change).

8.1.2. Ad-hoc reviews

This OMP will be reviewed when any significant changes in operational practice are made and on completion of any capital scheme which could impact the OMP.

8.2. Auditing

The regulatory authorities, where required, will be provided with reasonable access to audit the implementation of the OMP upon request.

8.3. Records

The following records will be maintained:

- Record of complaints are stored on CSMS
- Reports of investigations are held electronically
- Odour issues which require a capital scheme to be raised to resolve them

A. Awareness Raising Instruction

Activities that may result in an odour nuisance

All process operations staff must ensure that if a failure of plant, equipment or a system occurs, which may lead to complaints from customers, that the Regional Control Centre/Customer Services are informed in a timely manner.

Listed below (but not limited to) are some examples of the type of incident that are to be reported.

- Odour control plant failure
- Spillage of wastewater/sewage
- Spillage of sludge or sludge cake
- Failure of chemical dosing systems
- Odour monitoring equipment failure
- STC flare stack ignition failure

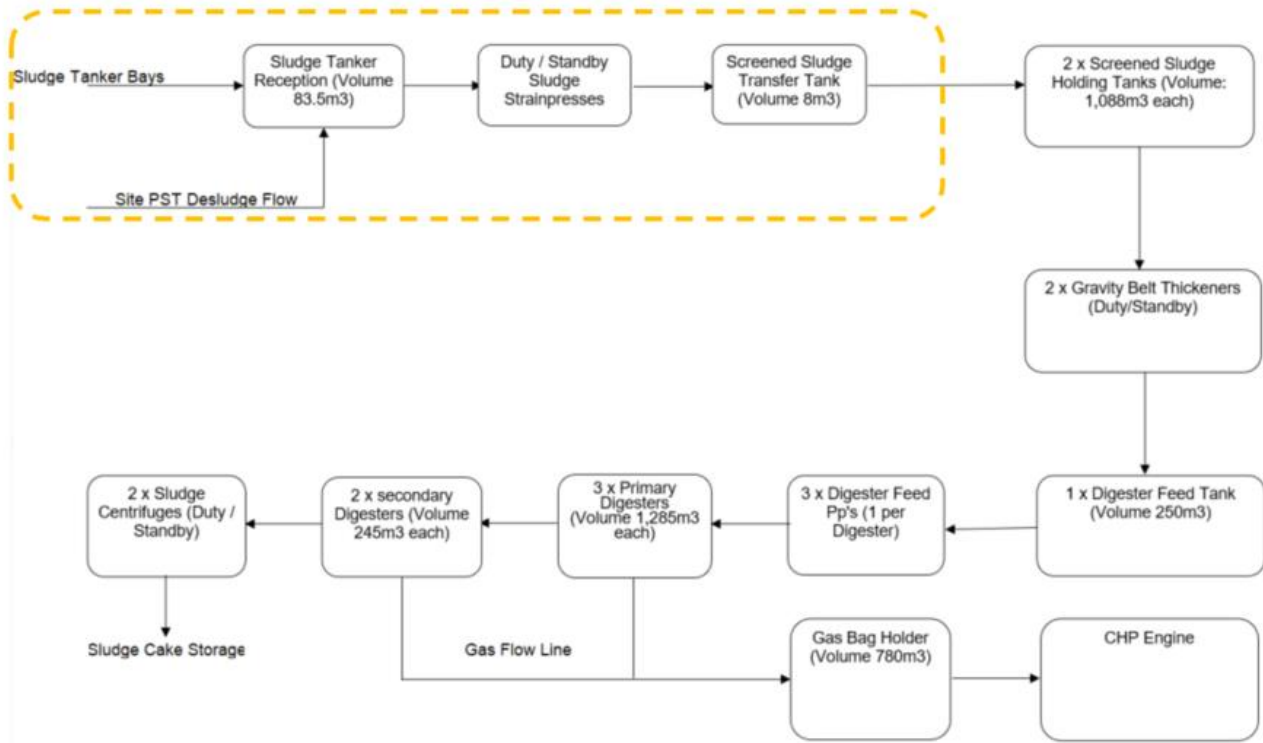
If the RCC or Customer Services are made aware of the problem, it means that they give a more constructive response to the person making the enquiry/complaint.

- In normal working hours, contact Customer Services on 01903 272685
- Outside normal working hours, contact the RCC and request information is added to the 24-hour report.

Every effort must be made to carry out the above request, a short phone call to share information with colleagues dealing directly with the customer will greatly help them deliver a more valid and informed response.

Be proactive, not reactive!

B. Odour Schematic



--- Covered by the OCU

C. Waste Codes

It is requested that the annual quantity of indigenous sludge and liquid sludge imports to be accepted is 211,067 tonnes.

C.1 Wastes featuring in the permit

Wastes imported for Anaerobic Digestion

EWC Code	Waste Description	Where accepted	Indigenous or imported	Justification for use
19 02	wastes from physico/chemical treatments of waste (including dechromatation, decyanidation, neutralisation)			
19 02 06	sludges from physico/chemical treatment other than those mentioned in 19 02 05 (sewage sludge only)	AD pre-digestion	Raw/digested cake-imported	
19 08	wastes from waste water treatment plants not otherwise specified			
19 08 05	sludges from treating urban waste water	AD pre-digestion	Indigenous/Imported	

Wastes to import under a waste activity permit

EWC Code	Waste Description	Where accepted	Indigenous or imported	Justification for use
16 10	aqueous liquid wastes defined for off-site treatment			
16 10 02 ⁵	aqueous liquid wastes other than those mentioned in 16 10 01 incl cesspit sludge	Head of works	Imported	The waste for this code will be cess waste, chemical toilet and portable shower waste only

C.2 Other wastes

Wastes received under the Controlled Waste Regulations 2012*

*Southern Water acknowledge these waste codes will not be included in a permit

EWC Code	Waste Description	Where accepted	Indigenous or imported	Justification for use
20 03	Other municipal waste			
20 03 04	Septic tank sludge	Head of works	Imported	20 03 04
20 03 06	Waste from sewage cleaning	Head of works	Imported	20 03 06

⁵ Cess, septic, chemical toilet and portable shower waste

D. Odour Checklist

This is a generic checklist applicable to all sites and aspects that are not applicable to a particular site should be ignored.

Area of works	Potential issue		Follow up action
Odour management plan (OMP)	Does the Site have an OMP?	YES / NO	Make changes to Site operation to minimise odour production and release
	Is the Site operated according to the OMP?	YES / NO	
Site - general	Are all covers in place?	YES / NO	Put back covers and close hatches as required
	Are all access hatches closed?	YES / NO	
Inlet works	Is the crude sewage black and/ or smelly?	YES / NO	Check incoming sewage for septicity (in communication with Operations Support Team)
			Check for potential septic discharges
Screening	Are there any spilled screenings?	YES / NO	Clean up spills
	Are the compacted screenings clean	YES / NO	Optimise operation of screenings handling equipment
Grit removal	Is there any spilled grit?	YES / NO	Clean up spills
	Is the grit clean	YES / NO	Optimise operation of grit handling equipment
Screening and Grit Skips	Do the screening skips smell?	YES / NO	Check that screenings are clean and free from organic material;
	Do the grit skips smell?	YES / NO	Check that grit is clean and free from organic material; optimise grit cleaning system if needed
	Are the screenings skips too full?	YES / NO	Empty skip(s)
	Are the grit skips too full?	YES / NO	Empty skips as needed
Storm tanks	Have the storm tanks been left full following a storm?	YES / NO	Empty and clean out tanks as needed
	Is there any sludge left in the bottom of the tanks?	YES / NO	
Primary tanks	Are the tanks black and / or smelly?	YES / NO	Check inlet for septicity

Area of works	Potential issue		Follow up action
	Are the tanks gassing?	YES / NO	Check levels of sludge in the tank and increase de-sludge rate if needed.
	Is there excess scum on the surface	YES / NO	Remove excess scum
Biological filtration	Are the aeration vents blocked?	YES / NO	Unblock aeration vents
	Is there any ponding?	YES / NO	Consider increasing flushing rate and/or forking media
Activated sludge	Do the dissolved oxygen levels in the aeration lanes match the setpoint(s) ?	YES / NO	Adjust dissolved oxygen levels as required
	Do the MLSS fall within the timelines for the Site?	YES / NO	Increase / decrease RAS rate as needed
Final settlement tanks	Are the tanks black and/or smelly	YES / NO	Check inlet of tanks for septicity
	Are the tanks gassing?	YES / NO	Check levels of sludge in the tank and increase de-sludge rate if needed
	Is there excess scum on the surface	YES / NO	Remove excess scum
Tertiary treatment	Any there any site-specific issues?	YES / NO	Investigate and rectify
Sludge treatment	Are there any sludge spills?	YES / NO	Clean up spills
Imports and Exports	Does the tanker filling and emptying process cause significant release of odour?	YES / NO	Investigate whether the process can be modified to reduce odour emissions
			Consider changing timing of tanker operations to reduce nuisance potential
Sludge Thickening and Storage	Are all covers in place?	YES / NO	Put back covers and close hatches as required
	Are all access hatches closed?	YES / NO	
	Are the doors to sludge treatment buildings / sludge cake stores kept closed?	YES / NO	Close doors as required
Anaerobic Digestion	Is all excess gas flared?	YES / NO	Contact contractor to investigate
	Is flare stack ignition immediate and reliable?	YES / NO	
	Are the Whessoe valves / pressure relief valves operating prematurely?	YES / NO	
	Are the seals on the condensate traps intact?	YES / NO	
Odour abatement	Is there any detectable odour downwind of the stack?	YES / NO	Check OCU using additional checklist
	Is the fan(s) working?	YES / NO	Arrange for fan to be repaired

Sandown STC
Odour Management Plan

Area of works	Potential issue		Follow up action
General	Are there any outstanding actions from a previous investigation?	YES / NO	Complete actions

E. ERG OCU Service Report



ERG (Air Pollution Control) Ltd

Bridge House Environmental Centre, Five Oaks Road, Slinfold,
Horsham, West Sussex, RH13 0QW, UK Tel: +44 1403 292 000
e-mail: maintenance@ergapc.co.uk web: www.ergapc.co.uk

Visit

Service Visit Report: 11 of 12 – November 2023

Project Name	Southern Water Maintenance	Project Number	AM7143
Visited	Sandown	Report By	Sam DEROUICHE
Company	Southern Water	Tel	01403 292000
Contacts	Andy Webb	Mobile No	07557878259
	Paul Hayden	Date	15/11/2023
	Nathan Twine	Reviewed By:	TJS
		Copy To:	HMcW, MMB, RW, SB, GL, TJS
Purpose of Visit	Monthly Service Visit of Chemical Scrubber OCU		

1. Priority Actions Required:

- 1.1. Scrubber 2 recirc pump 3 (04P220) is still leaking badly from the seal and requires urgent repair.
- 1.2. Scrubber 2 recirc pump 4 (04P240) has a reported faulty seal and requires pump service. The pump would not run when called for but appears available on MCC panel and HMI. This leaves no standby recirc pump for the alkaline scrubber and is a priority. 19/07/2023 Checked the panel and all the 3 main fuses are O.K. Checked wires and found one of the red phases (#13) at the outlet of the star contactor has a sign of overheated. It couldn't start in manual or in auto. No electrical drawing available. Spoke to SW electrician Jason King and he thinks that the main isolator still faulty and he's going to have a look at the issue. SW MEICA to investigate further.

ERG has issued quotation AM7143-58-Sandown-Remedials 20th Sep 23, for replacement pumps as replacement is deemed more cost effective than shipment to mainland for assessment and repair.
- 1.3. Caustic dosing pump 1 (04P480) would not operate when on duty. There was power to the pump and was available showing no faults, however the pump was not pulsing. Likely cause a simple relay failure. This leaves no standby caustic dosing if pump 2 fails. SW MEICA should investigate further.
- 1.4. At the hypo dosing cabinet for 04P550 and 04P580 pumps still a sign of a leak from somewhere as it was full of chemical at the bottom of the cabinet. After many attempts at identifying the source, it is still not clear where the chemical is leaking from. Found small leak at the inlet of the hand valve after the pressure loading valve (Main pipe to the scrubber).
- 1.5. Extraction fans AV mounts are degraded and need replacement. Due to these, the fans are vibrating when in operation.

ERG has issued quotation AM7143-58-Sandown-Remedials 20th Sep 23 with following scope of works:

- Scrubber S2 2No replacement recirc pumps
- Scrubber S2 injection point 'O'-ring seal replacements
- Hypo dosing cabinet #1 leak investigation, repair *if possible*
- 2No fan set AV mounts, pulley replacement (if required) and belt replacements
- 2No fan set balancing checks

2. Other faults and actions required:

- 2.1. There is a large crack in a joint on the inlet duct extracting from the cake barn. It is located on the lower section after the old venturi system next to the gas oil bulk fuel tanks. **ERG have quoted for repair including broken drain.**
- 2.2. Alkaline scrubber, at the injection point cabinet found full of a liquor. Checked and tested it was reading 7 pH. Further investigation required to find the leak. 19/07/2023 Checked the liquor SG scale was 1.089 which is 8% caustic and 6% hypo. This is requiring urgent attention. Still the same – Aug 23. Still some liquor. Sept 23 - checked and appears coming from recirc line and not the chemical lines.

3. Other comments:

- 3.1. TP1 moved to TP1 NEW for better velocity measurement.
- 3.2. A quote has been supplied for extraction from the sump near the office block where currently none exists.
- 3.3. Oct 23 - Alkaline scrubber, some barriers have been put by SW operator around the recirculation pumps area due to the bad leak (as it's become hazardous).

4. Condition monitoring:

Condition monitoring	Units	Nov	Oct	Sep	Design
Velocity at OCU inlet (TP1 NEW)	m/s	8.82	9.30	10.01	TBC
Airflow volume rate at S1 inlet Ø1,100mm	m ³ /h	30,162	31,793	34,258	TBC
ΔP across 1 st stage acid scrubber	kPa	0.74	0.59	0.66	TBC
ΔP across 2 nd stage caustic/bleach scrubber	kPa	1.47	1.77	1.49	TBC
Calculated OCU H ₂ S reduction efficiency	%	No load	No load	No load	TBC

5. Observations & other information:

- OCU Inlet H₂S monitor: FAULT 02 (Cal Due Jun 2023) 0 ppm (Gastec 4LL)
- OCU Outlet H₂S monitor: 0 ppb (New unit) <0.1ppm (Gastec 4LL)
- Acid tank MCC level (H₂SO₄): 61.70 %
- Caustic tank MCC level (NaOH): 38.25 %
- Hypo tank HMI level (NaOCL): 65.26 %
- Scrubber S1 controller value: 3.00 pH
- Scrubber S1 make-up rate: 340L/h
- Scrubber S1 recirc flow rate: 80.0 m³/h
- Scrubber S2 controller values: 9.25 pH & 784 mV
- Scrubber S2 make-up rate: 400L/h
- Scrubber S2 recirc flow rate: 293.8 m³/h (see item 3.3)
- Softener condition: Salt tank full, water tested: soft.

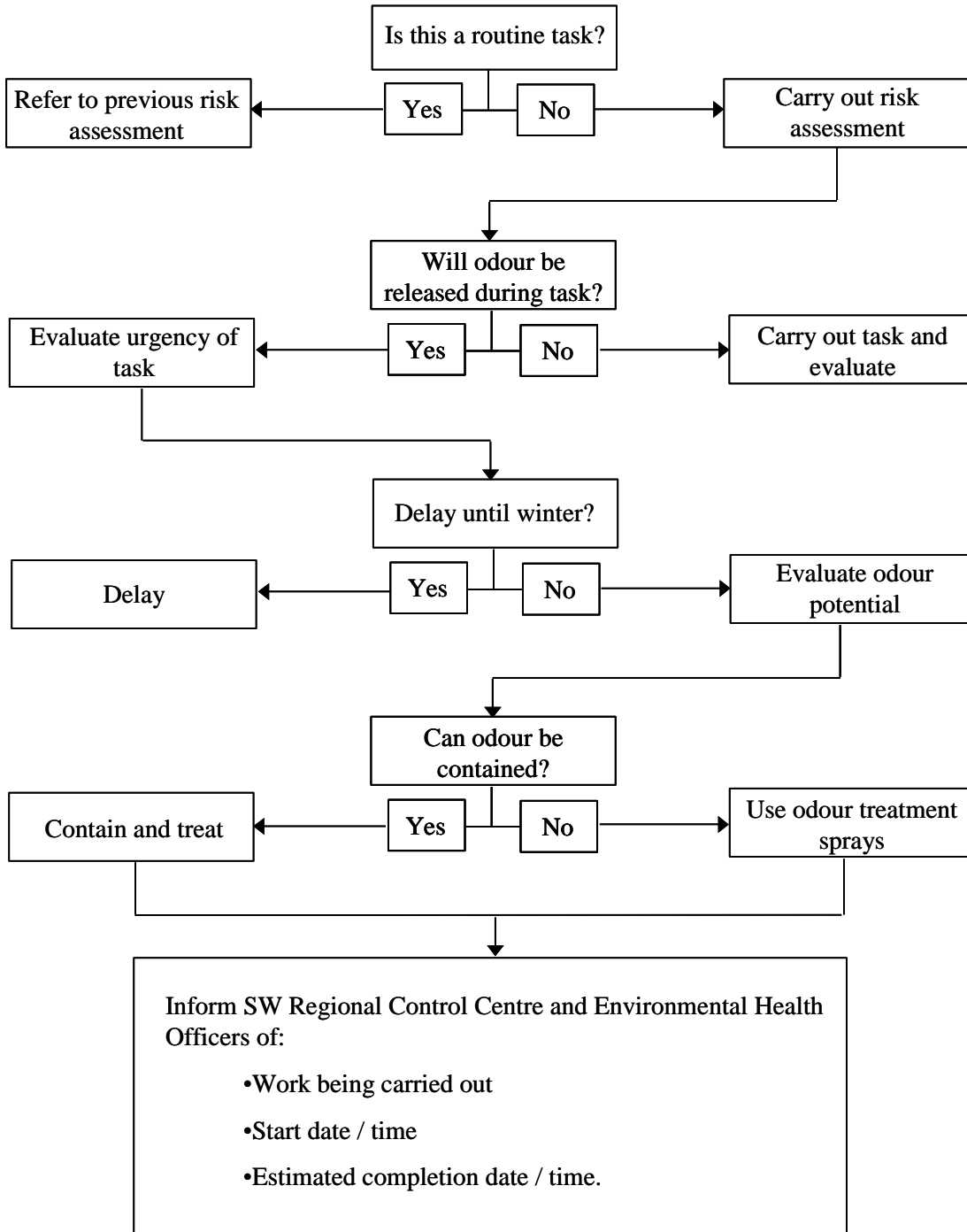
Belts sizes: extraction fans 04P350 and 04P370: SPC 3150.

Water filter size: Length = 10", \varnothing = 4" for filter housing 7382700, RS #: 738-2703, Mfg. model: DIY-RSC-7382703. Two spare filters left on site on top of the hypo cabinet.

HMI code = 1111

6. HISTORICAL FAULTS	DIAGNOSED
6.1. NONE.	

F. Risk Assessment Flowchart



G. Complaints Management

G.1 Management of odour complaints

G.1.1 System overview

Southern Water operates an integrated process to receive and record odour complaints by members of the public. It is designed to ensure complaints are dealt with promptly and consistently and a comprehensive record is kept. The following system ensures that these objectives are achieved:

- A unique and recognised point of contact for members of public and Southern Water staff to report odour incidents and issues
- A straightforward process for operational staff to investigate and mitigate odour issues after a complaint is received.
- A recognised point to provide feedback to customers
- A mechanism to review recent odour complaints and actions
- A database to capture trends and potentially serious problems to guide future improvement

The following sections describe how odour complaints are received and handled. This procedure may be augmented by local arrangement to provide a tailored service to meet local council requirements.

G.1.2 Receipt of odour complaints

The Customer Services is the first point of contact for members of the public to report odour incidents during normal working hours.

The Regional Control Centre can deal with odour complaints out of hours.

When a member of the public phones in to report odour from a Southern Water site, relevant information will be taken from the caller, including name, phone number, address, time, duration, the characteristics of the odour experienced and whether the customer would like to receive feedback by phone. Each call is assigned a unique CSMS number. The information is entered into the CSMS Database under a designated sort code.

Verification of the complaint is made through identification of the caller's property and the Southern Water site in question on electronic GIS maps. Following verification, a CSMS summary sheet is generated and transmitted immediately to the relevant FPM.

Where odour complaints are received directly by other Southern Water staff, the receiver of the call will contact Customer Services to log the call on behalf of the caller. The caller will be provided with the telephone number for Customer Service for future use.

All CSMS records of odour complaints are stored in the Corporate Information System to ensure transparency, visibility and consistency of the information.

G.1.3 Follow up actions

Initial action by Field Performance Manager

The FPM upon receiving a CSMS summary of odour complaint will investigate the issue as soon as practicable. Based on the sensitivity of the Site, the investigation may range from remotely checking the Site

alarms to the assignment of an operator to conduct a Site investigation. Site investigation will be guided by and recorded on a site odour incident form, if available, or on a generic Odour Risk Checklist. Where possible, actions will be undertaken by the operator to improve control of odour emission. Following the investigation, the FPM or the investigator will forward the findings to the Customer Liaison Officer during normal working hours or to the FPM at other times. If required in the site-specific OMP, FPM will also produce reports to the regulator within an agreed time period.

Feedback to the customer by Customer Liaison Officer or Field Performance Manager

Unless the customer had indicated that they would not wish to receive feedback, feedback will be provided at the earliest opportunity by the Customer Liaison Officer during normal working hours or by the FPM at other times. The Customer Liaison Officer or FPM will then close the CSMS call.

Action by Process Scientist

If requested by a FPM, a process scientist will carry out a further investigation where a site has received reoccurring odour complaints. Process scientists will advise FPMs of available options to mitigate odour, e.g., re-adjusting sludge disposal activities or process parameters. Process scientists will provide technical support if such measures are adopted. Process scientists will produce a written report for each investigation and follow up any further actions.

Action by Southern Water Managers

Managers will carry out regular reviews of odour complaints to all Southern Water sites and inform relevant FPMs where a trend is developing. Southern Water Managers will deploy additional monitoring resources where necessary to support the resolution of significant odour issues.

H. Odour Monitoring Form

Odour Monitoring Form

Date:	
Name:	Visitor or staff:

- Intensity**
- 0 – No odour
 - 1 – Very faint odour
 - 2 – Faint odour
 - 3 – Distinct odour
 - 4 – Strong odour
 - 5 – Very strong odour
 - 6 – Extremely strong odour
- Receptor Sensitivity**
- Low (e.g. footpath, road)
 - Medium (e.g. Industrial or place of work)
 - High (e.g. housing)

Location	Time	Weather conditions (dry, rain, snow etc)	Temperature (very warm, mild) <i>Use degrees when known</i>	Wind strength (light, strong) <i>Use Beaufort scale if known</i>	Wind direction (e.g. SE)	Intensity (See above)	Duration	Constant or intermittent in this period or persistence	Receptor sensitivity (See above)	Is source evident?	Any other comments or observations

