



ANGLIAN WATER SERVICES LTD. Kings Lynn Water Recycling Centre

Odour Management Plan to HS4 Standard

This document must be reviewed at intervals not exceeding 12 months

Revision	Authors	Date of Issue	Comments
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4	S Spencer	17/01/19	
5	S Spencer	03/03/20	
6	S Spencer	27/12/20	
7	S Spencer	20/12/21	
8	S Spencer	18/12/22	
9	S Spencer	15/12/23	

Note. This document is one part of a four part document and should not be issued separately. The sub Odour Management Plans should always be read in conjunction with the Odour Management Strategy and the General Information Section

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1. Overview

1.1 Introduction

Kings Lynn water recycling centre (WRC) sits in about 25 Acres to the North East of the town of Kings Lynn. We have industrial units to the East across the River Great Ouse, the nearest urban housing is circa 250 meters to the North of the WRC.

Site Consists of

- Administration building with office based staff
- An M+E team
- A collection team
- RES lorry base

To the North of the site is 3 primary tanks and to the East are 4 final settlement tanks.

Kings Lynn imports circa 750m³ liquid sludge and 100m³ cake sludge from other sewage treatment works and Thickening Centers per day. Maximum import volume is at 1000m³ per day.

Sludge is imported and treated. The Biogas produced during this process will then be used in the CHP.

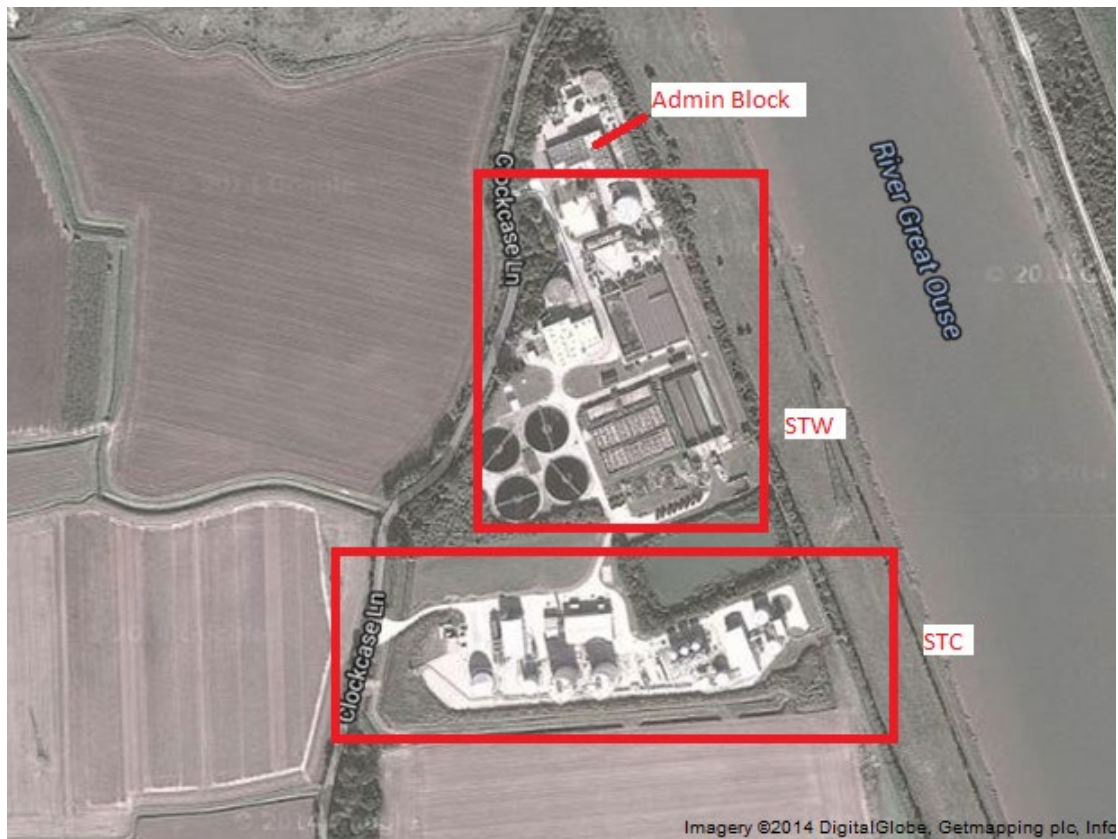


Figure 1: Kings Lynn site aerial view

1.2 Wastewater Treatment Processes

1.2.1 Kings Lynn Catchment

The catchment in Kings Lynn is comprised of a series of interconnected pumping stations which transfer flow into four terminal pumping stations which then pump effluent to the WRC where it is treated and discharged to the Great Ouse.

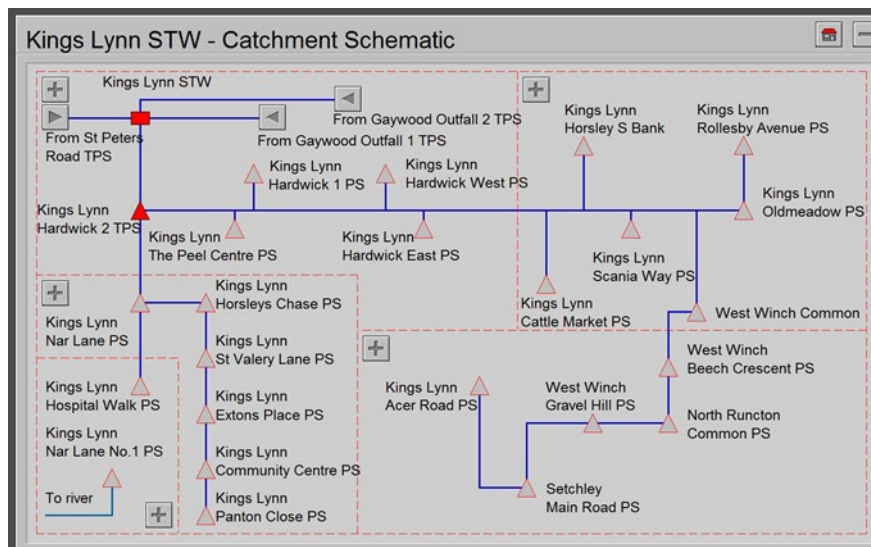


Figure 2: Kings Lynn catchment schematic, there is no odour dosing

1.2.2 The Water Recycling Centre- Preliminary Treatment

The treatment process begins with the removal of rag and plastics using 6mm mechanical screens. Grit is then removed in a square settlement tank and washed in the classifier before disposal. These processes are known as Preliminary treatment.

1.2.3 Primary Treatment

Preliminary treated sewage is distributed to three rectangular primary settlement tanks and suspended solids are removed intermittently under gravity for further treatment to prevent the build up of sludge in the tanks. This desludging operation is a potential but intermittent source of odour.

1.2.4 Activated Sludge (Biological) Treatment

The settled sewage from the primary settlement tanks is delivered by gravity to the activated sludge plant. This plant comprises a rectangular aerated tank that biologically oxidises the pollutants remaining in the flow from the primary tanks. Aeration is provided by adjacent blowers feeding air pipework submerged in the tank and equipped with nozzles. The high transfer of oxygen at the inlet of the aeration tank may potentially give rise to odours due to stripping of any residual septicity.

1.2.5 Final settlement

Mixed liquor from the aeration tanks is settled by gravity in four circular or radial settlement tanks separating the sludge from the clarified effluent which forms the final discharge to the River Great Ouse. There is little potential for odours from this source.

Activated sludge settled in the settlement tanks is returned to the aeration tanks to treat more sewage. This is known as Returned Activated Sludge (RAS). RAS flows from the base of the final tanks and is discharged from a pipe that terminates as an open pipe (the RAS Bellmouth) in an adjacent chamber at ground level. RAS from all four settlement tanks is passed into this chamber where it flows to the RAS pumping station to be pumped back to the aeration tanks.

1.2.6 Surplus Activated Sludge

Surplus Activated Sludge (SAS) is produced due to the growth of the micro-organisms in the aeration tanks and effectively is the excess RAS that is no longer needed. It is pumped to a gravity belt thickeners for thickening, before being transferred to sludge treatment centre for additional thickening and treatment prior to application as a soil conditioner on agricultural land.

1.2.7 Sludge Treatment Centre

The sludge treatment centre (STC) imports circa 750m³ of liquid sludge per day via holding tanks on the WRC. The sludge is then held in one of two buffer tanks which are covered and equipped with odour abatement. From here the sludge is pumped to gravity belt thickeners for thickening. The Gravity Belt Thickeners are enclosed in a building from which off-gases are extracted to an odour control unit. Liquors produced are discharged via sealed drainage to the inlet works of the adjacent WRC. It also imports 100m³ of cake sludge into the Cake Reception Center which then pumps the watered down cake into a Blend Tank where it is mixed with the liquid sludge imports and the indigenous sludge make of the site. The Cake reception Center has it's own Odour Control System which air in the building when the cake is delivered removes and scrubs before releasing to atmosphere. The mixed sludge is then anaerobically digested in which microorganisms break down most biodegradable material in the absence of oxygen to produce biogas. A significant portion is methane which can be burnt to produce electricity.

The digestion process is divided into two treatment stages, beginning with a biological hydrolysis converting complex carbohydrates, proteins and fats into more simple amino acids, fatty acids and simple sugars. These compounds are then converted into biogas primarily methane and carbon dioxide. The benefits of this process are:

- A higher conversion rate of volatile organic matter to biogas.
- Pasteurisation of the sludge cake.
- A reduction in sludge cake quantities produced.
- Less odorous product for storage and spreading to land.
- Renewable energy generation from the enhanced production of biogas.
- Mothballing lime stabilisation process.

- Reduced fuel consumption and carbon emissions from transport.
- Agricultural recycling.

The remaining digested sludge is then centrifuged to remove excess water, reduce volume and to create a product that is stackable. The treated product is then discharged into roll-on/off skips. Once full these are covered and removed from site for recycling to agricultural land. Skips are removed on a daily basis, unless awaiting HACCP results, in which case up to six skips could be stored for up to two days.

2. Management Structure and Overview

Table 1: Site management description of responsibilities

Role	Responsibilities	Training
Treatment Manager	Responsible for all activities on the WRC and STC	Licence to Operate – Treatment Manager
Assistant Treatment Manager	Responsible for the day to day supervision and running of the STC	Licence to Operate – Assistant Treatment Manager
Customer Liaison Manager	Responsible for managing the interface between operations and the customer to ensure a satisfactory outcome is achieved	
Optimiser	Responsible for the day to day supervision and running of the WRC	Licence to Operate - Sludge Technician (in progress). Sludge Treatment HACCP. OCU Manufacturers Training
Sludge Technician	Responsible for the routine maintenance activities carried out on the STC	Licence to Operate - Sludge Technician (in progress). Sludge Treatment HACCP. OCU Manufacturers Training
Works Technician	Responsible for the routine maintenance activities carried out on the WRC	Licence to Operate - Works Technician

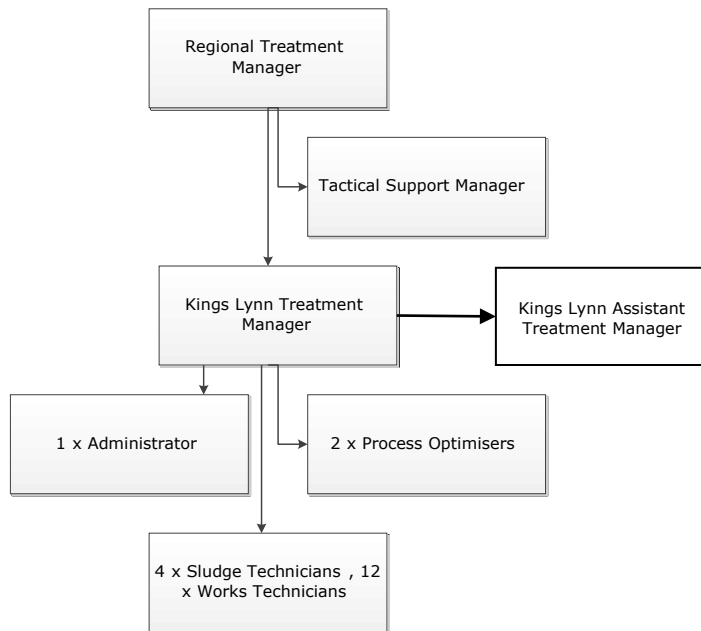


Figure 3: Site management structure

3. Odour Modelling

The frequency of wind direction and the distance to the nearest properties are key factors in determining likely odour impacts.

Odour modelling has been commissioned for this site as part of the IED permit application – refer to this for more information (Kings Lynn Odour Modelling Report). Wind rose and information generated for the odour modelling report have been used to determine the direction of any potential odours released from the site. The model was run using the meteorological 2018 to 2020 years to test the variability of the odour concentration results among the different years.

On any future odour modeling report this is how the odour offensiveness will be categorised. In the odour modelling report these contour lines are shown for the odour concentrations of 1.5, 3, 5, and 10 OUE/m³. The significance of these odour concentrations is explained below:

- 1 OUE/m³ is the level of odour detection under laboratory conditions.
- 3 OUE/m³ is the level of odour detection in open environment. Complaints are unlikely to occur and exposure below this level are unlikely to constitute significant pollution.
- 5 OUE/m³ is when odour becomes detectable & recognisable. Complaints may occur and de-pending on the sensitivity of the locality and nature of the odour.
- 10 OUE/m³ is when odour becomes distinct and intrusive. Complaints are highly likely and odour exposure at these levels represents an actionable nuisance.

An odour concentration of 1.5 Odour Units Per Cubic Metre (OU/m³) has been taken as the benchmark level at which nuisance and potential loss of amenity would be anticipated. This assessment criterion for the protection of public nuisance/amenity is in line the Environment Agency (EA) H4 Planning Guidance, including septic effluent and sludge in amongst a range of substances categorised as most offensive and for which a low detection threshold should be taken into consideration.

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 guidance²

- High sensitivity receptors e.g. residential dwellings, hospitals, schools/education and tourist/cultural.
 - users can reasonably expect enjoyment of a high level of amenity; and
 - 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 wouldn't reasonably expect to enjoy the same level of amenity as in their home; or
 - people wouldn't reasonably be expected to be present here continuously or regularly foreextended 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; or
 - 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 to:

- 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 odourconcentration/ 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. Odour Risk Assessment

3.1 Summary of Main Risks and Controls

Table 2: Summary of Main Risks and Controls

Source	Location	Origin	Quantity (m ³ /d)	Odour Emission Rates	Comments	Contingencies
Indigenous Primary Sludge (liquid)	PS SP Feed Tank	PST Desludge Well	230 (at 2.5%DS)	High 8 to 160 OUE/m ² .s	Odour emissions can increase to over 2000 OUE/m ² .s if the sludge is septic or agitated. Need to ensure frequent desludging of PSTs. Particularly during summer months.	Desludging is carried out six days a week as part of the site routine activities. Visual monitoring for septicity is undertaken by competent technicians (deemed competent by Anglian Water's accredited Licence to Operate Scheme). Should any septicity occur or an increase in sludge held in the PSTs is detected the first stage response would be to increase the length of time that desludging is undertaken. Should further measures be required it is possible to reduce the tankered sludge imports into the site to allow more treatment capacity for the sites indigenous sludges. During the site annual shutdown (pressure vessel inspection legally required yearly), sludges will continue to be removed from the process and will be temporarily stored in tanks in the STC before being treated

Indigenous SAS (liquid)	SAS Buffer tank	RAS/SAS pump station	905 (at 0.7%DS)	Low 0.1 to 2.8 OU _E /m ² .s	Odour emissions can increase to 3 OU _E /m ² .s if the sludge is septic or agitated.	Activated sludge levels or mixed liquor suspended solids (MLSS) are monitored six days a week as part of the site routine activities to ensure that the correct concentrations of biological activity are present. The activated sludge system is aerated so septicity is unlikely. Should concentrations of MLSS increase due to increased biological load from either domestic or industrial sources an increased amount of sludge (SAS) will be surplussed to the STC. This is manually controlled on site and is easily adjusted. Should this be required it is possible to reduce tankered imports into the STC to ensure that there is capacity for indigenous sludge's. During the site annual shutdown (pressure vessel inspection legally required yearly), sludges will continue to be removed from the process and will be temporarily stored in sealed tanks in the STC before being treated
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Imported Raw Mixed Liquid Sludge	Import sludge tank	Small satellite sites	750 (at 3.5%DS)	High 2.6 to 13 OU _E /m ² .s	Odour emissions can increase to over 2000 OU _E /m ² .s if the sludge is septic or agitated. Need to ensure reliable sludge import/export.	Should there be any operational problems on site, the sites own indigenous sludge will always take priority. Imported sludges are scheduled from across the region based on a prioritisation mechanism. If a treatment centre has to close due to breakdown etc, it is possible to re-schedule these sludges into an alternative treatment centre (Kings Lynn is 1 of over 15 Treatment Centres AW Operates). Most AW satellite sites have < 2 weeks sludge holding capacity and so sludges are generally continuously collected as they are produced, this also reduces septicity from occurring. During the site annual shutdown (pressure vessel inspection legally required annually) no imported sludge's will be brought to site.
Imported Raw Mixed Cake Sludge	Cake Reception Center	Dewatering Sites	100m ³ (at 20% DS)	High 2.6 to 13 OU _E /m ² .s	Odour emissions can increase to over 2000 OU _E /m ² .s if the sludge is septic or agitated. Need to ensure reliable sludge	Should there be any operational problems on site, the sites own indigenous sludge will always take priority. Imported sludges are scheduled from across the region based on a prioritisation mechanism. If a treatment centre has to close due to breakdown etc, it is possible to re-schedule these sludges into an alternative treatment centre (Kings Lynn is 1 of over 15 Treatment Centres AW Operates). Most AW satellite sites have < 2 weeks

					import/export.	sludge holding capacity and so sludges are generally continuously collected as they are produced, this also reduces septicity from occurring. During the site annual shutdown (pressure vessel inspection legally required annually) no imported sludge's will be brought to site.
Enhanced Digested Liquid Sludge	Post digestion tank	Digesters	790 (at 4.3%DS)	Low 2.6 to 13 OU _E /m ² .s	Odour will reduce with enhanced digestion process provided stable digestion parameters are maintained.	The digestion process is monitored for stability daily (as part of the site HACCP plan). The digested sludge is contained within a covered and odour extracted tank. Monitoring of the digester performance is carried out by the Treatment Manager and Optimiser on a continuous basis
Enhanced Digested Sludge Cake	Cake storage pad	Sludge dewatering	161 (at 23%DS)	Low 2.6 to 13 OU _E /m ² .s	Initial odour potential of 5 but can increase to 13 if stored for 3 days but will decrease to 2.6 for long term storage.	The digested cake is initially stored within skips on the small concrete pad at Kings Lynn STC. Cake is collected and transported to farming land as soon as practicable.
Screenings from raw sludges	Imported sludge SP, SAS SP and Primary	Indigenous and imported sludges	3Nr skips on site	High	Odour emissions from screenings can vary significantly	The screenings are all washed before being transferred into storage skips and are checked six days a weeks for odour. Should any odours occur before the skips are full they can be removed from site and land filled

	Sludge SP			20 to 200 OU _E /m ² .s	depending on build up of fat and grease. Storage of screenings should be limited and skips covers as soon as possible.	
Dewaterin g liquors	Return liquors well	Dewaterin g centrifuge s	825	Low 1 to 10 OU _E /m ² .s	Majority of odour from the return liquors will be due to Ammonia. Liquors should be returned to the works as soon as possible.	The liquors are returned to the WRC via a pumping station, there are duty/standby pumps in this well and so it is low risk in being able to remove these from the STC

3.2 Management of Odorous Materials

Odorous materials can be managed in two distinct ways:

- Pro-active management
- Reactive management

Pro-active management concentrates on routine measures to minimise odour emissions by good practice in the operation of the processes on site.

Reactive management of odour emissions is the activity taken to reduce odour emissions when a potential emission to atmosphere is identified, either by site operatives, through complaints or process feedback.

At the WRC, it is not possible for the site operators to divert sewage away from the site if there is a problem. It is therefore essential for the treatment processes on site to remain operational at all times.

3.2.1 Pro-active management

Good house keeping plays an essential part in reducing odour emissions from the site. Site operators perform daily site inspections to ensure there are no spillages from tanks and tanker deliveries and are instructed to clean spillages as soon as possible. Tanker drivers have been instructed to clear their discharge pipes with the tanker still connected so that any remaining odorous gases are contained within the import tank and odour abated. Any sludge spillages during discharge are immediately hosed into the adjacent drain and returned to the WRC. Tanks that have been taken out of service must be kept empty and clean to avoid odour.

All Works Technicians at Kings Lynn WRC have a responsibility to maintain good housekeeping and clear spillages at the earliest opportunity to prevent unnecessary odour. Anglian Water has a framework agreement with Industrial Water Jetting and JK Environmental who can provide additional clean up services at short notice.

In addition there are 2 Odour Control Units on the STC which proactively draw air from potentially odours areas and filter them through media to remove any odours before releasing the air back to the atmosphere.

The 2 units are in areas 2 and 5 and are closed, forced, constant flow rate units made by Plasticon. They are monitored weekly and recorded in the Odour Monitoring Book on site. Any defects are raised through our Tactical operation Team, prioritised and attended by our M&E Team to be rectified. Once a job is raised it is recorded in the Defects Log Book on site and M&E update this book with progress. Media change is recommended every 10 years.

3.2.2 Key areas at risk from spillage and control measures

The key areas at risk from spillage and associated control measures are as follows:

- Compactor/screen area.

A maintenance technician skilled in both mechanical and electrical maintenance of compactors and screens is available on a daily basis. Should a serious breakdown occur Anglian Water has a framework agreement with M&N electrical who specialise in the hire and refurbishment of screens and compactors.

- Centrate pumping station well.

Pumps are duty/standby

- Entire site.

Daily inspections by site operators

Routine site inspections by Treatment Manager - a minimum of once per month.

Site operator shifts are managed by the OMC to ensure that sickness and holidays are managed centrally across all sites and critical activities are given the highest priority. The shift system implemented on the site ensures 12 hours per day of coverage, 7 days per week. .

Scheduled daily jobs include the routine operational maintenance and monitoring of all odour abatement equipment. Odour abatement equipment is maintained by site staff in accordance with suppliers' instructions. Additional maintenance beyond the scope of site staff is scheduled as part of the Kings Lynn maintenance plan and instructions are passed to maintenance staff via the 'Click' system. 'Click' is a computer based scheduling system that deploys work directly to Works Technicians laptops and records jobs completed onto a central SAP (Strategic Action Plan) system

3.3 Reduction of Emissions

Digester stability is key to achieving a stable, low odour product. The digesters at Kings Lynn are closely monitored; key parameters include the digester temperature, retention time and gas production.

3.4 Containment and Abatement

Within the STC, Odour Control Units (OCU's) have been located at key points to mitigate odours from the site (the blending tanks, the GBT building and the centrifuge building)

The OCUs for the site are on a rolling investment programme which allows for the financial budgeting of their costly, periodic maintenance. Small OCU (under £2,000) will be managed within the local operational budget but larger units are entered into an asset register with date of instalment and expected date of refurbishment to ensure adequate funds are made available.

Maintenance and monitoring requirements in relation to the odour control system to be undertaken at the site including daily/weekly/monthly/annual checks and servicing (links to log books and check sheets to be included)

Emission Point Type	Parameter	Monitoring Frequency	Monitoring standard or method
Channelled emission to air (biofilter and scrubbing system)	Ammonia	Once every 6 months or more frequent if stated in the permit.	Emissions of pollutants into the environment through any kind of duct pipe stack etc. As per design and manufacturer's specifications EN ISO 21877
	H ₂ S		CEN TS 13649 for sampling NIOSH 6013 for analysis
	Odour concentration		BS EN 13725
	Efficiency checks	Annual	Annual report detailing the removal efficiency of all abatement systems and planned maintenance including media health air flow distribution and emissions removal efficiency BS EN 13275
	Media moisture and gas flow temperature	Weekly	Recorded using a moisture meter and temp probe
	Gas stream flow	Continuous	As per design and manufacturer's specifications
	Surface condition	Weekly	Visual assessment
	Thatching and compaction	Weekly	Back pressure

3.5 Agreed thresholds with Environment Agency/Environmental Health Officer

Currently there are no thresholds or limits agreed with the Environment Agency (EA) or Environmental health Officer (EHO) for odorous gasses at Kings Lynn STC or WRC. Historically the site has not had ongoing issues with odours or complaints from our neighbours.

3.6 Contingency and Emergency Planning

3.6.1 Breakdowns

In the event of a breakdown the responsible person creates a job which is then raised via Anglian Water's Operational Management Centre (OMC). The response time for remedying breakdowns is dependant upon the criticality of the plant, response codes are:

- A0 Within 1 hour.
- A1 Within 4 hours.
- A2 Within 1 day.
- A3 Next day.
- A4 Next 2 days.

All critical plant at Kings Lynn are allocated a response code of A1. Jobs are allocated by the OMC via our electronic scheduling tool, 'Click'. This identifies an appropriately qualified person who is able to respond within the timescales determined by the response code.

The site holds many spares for key equipment and framework arrangements are in place for critical plant including lead times for delivery to site. In addition, maintenance contracts are in place with many suppliers and include the requirement for them to store spares on Anglian Water's behalf.

There are some specific aspects of sludge treatment activities which may lead to short or medium term odour issues and therefore require particular attention.

- Sludge gravity belt thickeners.

These units will thicken all the blended sludge on site before it is pumped to the monsal feed tanks. The sludge includes imports and indigenous sludge which originates from the primary tanks or the activated sludge plant. Although short term failures of one or more machines would actually reduce odour from each unit, the knock on effect of failure of more than one machine and reduced treatment would eventually lead to a rise in the level of sludge held in the primary tanks and sludge storage tanks, with a potential for an increase in odour generation.

If one or more machine were to fail, the remaining machines could be run for longer duty periods. However, if three or more belt thickeners were unavailable in excess of four days the EA will be informed. In this case, stopping sludge imports could be considered. For a prolonged failure, hired centrifuges are available from some of our framework suppliers

- Digested sludge dewatering centrifuges.

The existing units dewater sludge from the post digestion tanks. This is the final stage in the process and as such has buffering within the upstream processes. As with the belt thickeners, sludge originates from the imported liquid sludge reception, cake reception and from the primary tanks on site or the activated sludge plant. Short term failures of one or more units would actually reduce odour from these units. The eventual knock on effect of cessation of sludge final dewatering (ie the failure of all units) would be to raise the level of sludge held in the primary tanks and sludge storage tanks, with the potential for an increase in odour. As a contingency, measure, sludge imports of liquid can be stopped and existing tanks used to provide storage. This action would be triggered only if 50% of the units or more units were to fail. If all centrifuges are unavailable (severe cold weather events for example) for more than four days the EA will be informed.

- Steam Boiler

If the steam boiler is out of service, the STC cannot process the sludge, eventually leading to the build up of sludge in the upstream processes. This would be a high priority item as it would result in the diversion of sludge imports to other STCs and would require the export of indigenous sludge in the long term. The boiler is under a maintenance contract with the supplier which includes a detailed maintenance schedule and a quick response call-out system in case of emergency. Furthermore, the STC operators perform daily check on key boiler parameters to ensure its efficient and reliable operation.

3.6.2 Flood, Fire and Extreme weather

Hot and dry weather is likely to increase odour emissions by increasing evaporation rates, reducing dispersion when wind is low and increasing the residence times in the sewers leading to increased septicity and odour emissions. Heavy rain after dry weather will produce a first flush of strong sewage likely to cause increased odour at the inlet works as well as overflowing to the storm tanks where raw sewage can be stored for short periods. It is therefore essential that the inlet works and storm tanks are managed closely to avoid odour nuisance during changing or extreme weather conditions.

Historically this has not caused a noticeable increase in odours outside of the site boundaries. A planned preventative maintenance program is in place to remove any build up of solids, fats, grease or debris in potentially problematic sewers and pumping stations in the catchment.

Point sources of odour on site are checked daily by the site operator and if necessary the planned preventative maintenance or sewer and pumping station cleaning program can be increased. The storm flows that accumulate in the storm tanks are returned to the inlet works for treatment in the WRC as soon as flows permit and the storm tanks will be cleaned after emptying to ensure odour emissions from residues are minimised.

Freezing can prevent the operation of valves, pumps and other equipment leading to sludge build-up in the process. Trace heating or insulation is installed on critical plant to ensure continued operation through out the winter months. Snow fall or frozen roads can also limit access to the site

limiting chemical deliveries. Chemical deliveries are delivered in bulk and re-ordered with a number of weeks capacity left on site. In addition we have the capacity onsite to grit the access roads, or in prolonged severe weather external contractors can assist with gritting.

Fire and flood contingency plans are included in the Gas Contingency Plan for the site, detailing what is to be done and how to recover from these events.

3.6.3 Power Failure

In the event of a power failure, Anglian Water has a framework contract in place with 2 separate generator companies with 24/7 cover.

3.6.4 Abnormal Operation/Construction

Any planned construction beyond ongoing maintenance on site will meet the requirements of Construction Design and Management Regulations 2007. Currently there are no significant construction projects planned onsite at Kings Lynn either in the WRC or the STC. If this changes all new work will require a Pre-Construction Site Management Plan which will be developed to cover the construction and commissioning period of proposed works. The strategy/plan will be continually reviewed in line with site conditions to ensure that the process capabilities of the works will not be compromised. Under the agreed delivery model, construction and commissioning gateway governance shall be completed and approved by key stakeholders, which includes the Operational Treatment Manager. The document covers management of environmental impacts of the construction, including how odour is to be managed and minimised while work on site is on-going.

In the event that an activity is assessed as a medium or high risk of odour nuisance the activity shall be undertaken under an impact plan. Impact Plans are used by AWS to manage non routine activities that have the potential to impact on works compliance, health & safety and customers. The plan is designed to ensure appropriate controls, mitigation and communication procedures have been identified and are followed appropriate to the task. Such examples where odour risk is identified and an impact plan is required, mitigation actions may include:-

- Revised construction sequence and commissioning activities that shall reduce / remove odour generation
- Revised commissioning sequence
- Utilisation of existing odour control equipment, possible extension via temp measures to accommodate additional areas
- Provision of temporary odour reduction plant
- Enabling new odour management plant earlier within construction programme
- Provision of temporary sufficient spray systems to mask odour.

The Regulators will be made aware of any event which may lead to a risk or temporary increase in odour, the mitigation measures put in place and time scales for the work to be undertaken.

5. Monitoring Procedures

4.1 Monitoring of Odours

The site operation administrator (office based staff member) maintains a site log book for detailing any odours highlighted by staff or members of the public. These will be investigated and recorded in the site odour diary.

Table 3: Monitoring of onsite odours template

Date / Time of Test					
Location of test onsite					
Location of test off site					
Weather conditions (dry, rain, snow, fog)					
Temperature (cold, mild, warm, very warm or degrees if known)					
Wind strength (none, light, steady, strong, gusting)					
Wind direction (eg: from NE)					
Intensity (see below)					
Duration					
Constant or intermittent during period					
What does it smell like?					
Location sensitivity (see below)					
Is the source evident?					
Additional comments / observations					

Monthly spot samples will be taken and analysed using a Hydrogen Sulphide Analyser with a detection limit of at least parts per million. The locations these samples will be taken from are outlined in Figures

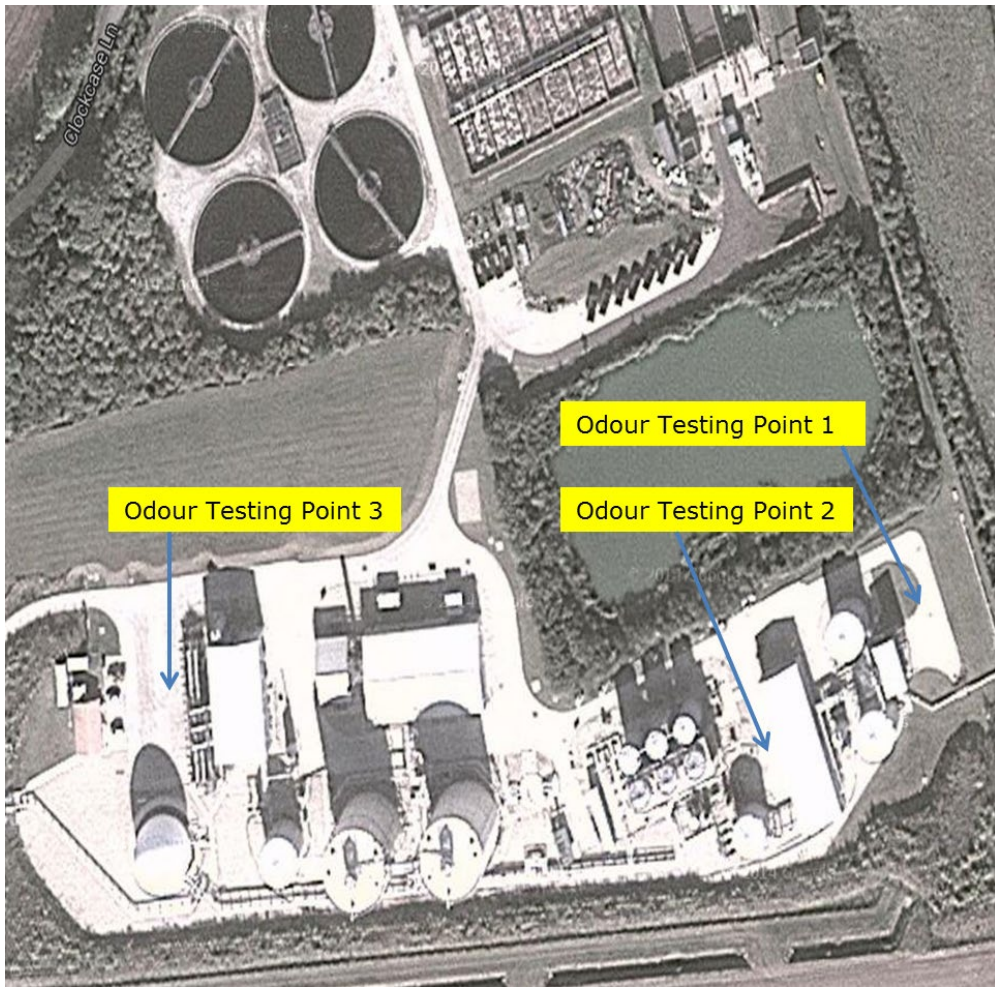


Figure 4 onsite odour testing locations



Figure 5: Offsite odour testing locations

Table 4: Monthly spot samples for Hydrogen Sulphide

Location (Please see attached maps)	Date	Time	Sampler Name (Block Capitals)	H2S Reading	Instrument calibrated (Y/N)	Weather	Comments
Odour Testing Point 1							
Odour Testing Point 2							
Odour Testing Point 3							
Odour Testing Point 4							
Odour Testing Point 5							
Odour Testing Point 6							

4.2 Monitoring of Performance

The OCU's are monitored as part of the technicians ongoing plant checks and the motors are fitted with telemetry alarms to advise of any mechanical issues. The media *insitu* is changed as per the manufactures guidelines.

6. Complaint Management

All complaints directly received by Anglian Water through the contact centre are recorded on SAP and assigned a job type and priority (depending on the details received from the customer at the time). These complaints are then passed to the local team for investigation and action. Complaint numbers/dates can be shared with the Environment Agency and the District Council on request.

5.1 Dealing with Complaints and Reporting

Anglian Water employs Custom Liaison Managers (CLMs) who handle customer contacts on a day to day basis. Any complaints received by the Contact Centre are passed to the CLMs to gather the relevant information and reply to the customer. Complaints that are sent directly to the Treatment Manager are investigated and responded to by the Treatment Manager or CLM.

5.2 Record Keeping

Details of all complaints raised by the Contact Centre are stored on SAP. This includes the actions taken by the field agents and details of conversations with the public. Details of all complaints received by the Treatment Manager are kept and logged with relevant CLM and in the onsite diary.

5.3 Community Engagement

There is a CLM assigned to deal with all customer issues at Kings Lynn, in addition in conjunction with DOW chemicals on the opposite side of the Great Ouse the treatment manager attends a quarterly liaison meeting with local business and residents. In the event of any construction or ongoing issues on site it is proposed that Anglian Water would communicate with local residents via community newsletters and by liaising with local councillors.