



## Bioresources Permitting

Strongford Sewage Treatment Works Environmental Permit Application

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## 1. Non-Technical Summary

This application is for the substantial variation of the site's existing IED environmental permit under the Environmental Permitting (England and Wales) Regulations 2016 (as amended). It relates to the permitting of indigenous sewage sludge and imported sewage sludge and other wastes for treatment by anaerobic digestion for the Strongford Sewage Treatment Works, operated by Severn Trent Water Ltd.

The substantial variation to the permit is to amend an existing listed activity, the biological treatment by anaerobic digestion, of indigenous sewage sludge in a mixture with imported cess and septic tank derived wastes to reflect the treatment of non-hazardous wastes only. It removes an existing listed activity relating to the blending of hazardous waste with indigenous sludge prior to digestion. There is an additional listed activity added, for the operation of an existing liquor treatment plant (LTP) at the site, to aerobically treat process liquors prior to their return to the works inlet for full treatment. There is also the addition of a second listed activity for the recovery of ammonia by chemical stripping from some of the process liquors prior to their return to the works inlet for full treatment. These two additional listed activities operate in parallel, with some returns liquors being treated by each process. The LTP is an existing unit which has been operational for a number of years but was not previously identified within the permit. The ammonia recovery plant is a newly installed piece of equipment, which is being trialled at the works.

This variation retains the operation of biogas and natural gas fuelled boiler units for the generation of heat to the THP plant, in addition to permitted CHP engines at the site. These combustion plant remain as currently permitted. Biogas may also be treated through a biogas upgrading unit (gas to grid plant) which is within the current permit.

The site is currently permitted for a waste operation for the import of suitable liquids and thin sludges to the works inlet; and for a waste operation for the import of treated sewage sludge from other works for dewatering. There is the addition of a self bunded import tank to temporarily store tanker imported wastes prior to treatment through the inlet, as well as clarifying that amongst the currently permitted imports, is raw sludge from other works, to the THP process.

There is the addition of a new waste treatment process that treats incoming urban waste water delivered by the sewerage network to the site, to recover cellulose in the form of cellulose fibres from part of the incoming UWWTD stream.

### Activities

The anaerobic digestion process treats sewage sludge arising from the indigenous treatment of UWWTD derived materials supplied to the site by the sewer network and from tanker imports of waste materials to the works that are similar in composition to UWWTD derived materials. Indigenous sludge is mixed with imports of waste sludges from other wastewater treatment plants and subject to biological treatment via anaerobic digestion within one of three anaerobic digester tanks located on site. Previously, sewage treatment sites operated by sewerage undertakers importing sludges and liquids were only regulated for the import and treatment of these materials to the wider site and indigenous sludges arising from the treatment of sewage was not required to be included in a permit. It has now been determined that the treatment of indigenous sludges do need to be permitted as they fall outside of the Urban Waste Water Treatment Directive (UWWTD).

This substantial variation applies to both permitted activities at the site and is for the:

- Removal of the listed activity for the blending of hazardous waste prior to treatment at the site. Note that the infrastructure for this activity remains in use at the site, the removal of the listing is due to there being no equivalent listing relating to non-hazardous waste;
- Biological treatment by anaerobic digestion of non-hazardous wastes only;

- Addition of a new listed activity at the installation, to add an existing liquor treatment plant to treat liquor generated by the dewatering of treated digested sludge at the site, in order to reduce the strength of the liquor returned to the head of the works;
- Addition of a new listed activity at the installation to add a new ammonia recovery plant to treat liquor generated by the dewatering of treated digested sludge at the site, in order to capture ammonia for beneficial reuse in the longer term;
- Clarification of EWC codes for different activities at the site;
- Clarification of process throughputs to include indigenous arisings;

In addition, the waste activity at the site will be varied to include:

- Clarification of the scope of the current directly associated activity to include sludge imports to the THP plant on site from other works;
- Addition of a self bunded, covered, holding tank at the works inlet, to enable imports to be retained prior to release into the main treatment flow;
- Addition of a cellulose recovery plant which recovers cellulose fibres from the incoming urban waste water.

All activities will have clarity provided as to the acceptable waste types for the specific process, and throughputs adjusted to reflect tonnages for each process. There is also an apparent increase in site throughputs through comparison with the current site permit. However, the revised throughputs include indigenous arisings which were excluded from the current permit. Therefore, the increased throughput will not impact on the overall volumes of waste being treated.

There are also associated updates to the permit scope and site plan to reflect changes to air release points, transfer and sampling points.

The installation covers the biological treatment of sewage sludge, both indigenous and imported from other waste water treatment sites, in a mixture with imported cess and septic tank derived wastes, by anaerobic digestion, with a capacity above the relevant threshold. There are a number of currently permitted directly associated activities, including the pretreatment of sludge using a thermal hydrolysis process (THP); operation of a biogas fuelled CHP units for the generation of electricity and heat at the site, which is currently permitted under the Medium Combustion Plant Directive and export of biomethane from a biogas upgrade unit.

The site is located in a semi-rural setting on the south side of the city of Stoke on Trent. The River Trent runs to the west of the site across agricultural land.

The first waste activity comprises an offloading coupling for tankers and cess vehicles to discharge through, located at the works inlet into a self bunded, holding tank. The waste permit variation will provide the works with additional protection from 'higher strength' wastes, that is, wastes with elevated ammonia and BOD/COD levels, which can cause problems for aerobic treatment. These wastes will be discharged into the holding tank and then released into the main flow at a reduced flow rate compared to normal tanker discharge rates. The tank can also be used to hold incoming tanker loads during storm condition periods. All tanker imports are subject to pre-acceptance and acceptance procedures, which include being passed through a logger to record the incoming volume and the company carrying out the import. Once the tanker waste has mixed with the incoming UWWTD material, its treatment falls outside the scope of the Environmental Permitting Regulations.

The site is currently permitted for a second waste activity, relating to the imported digested sludge from other works for dewatering at the facility using the plant on site and storage on the cake pad, pending application to land in the same manner as indigenous wastes.

This variation will clarify the scope of the current waste import activity which includes the import of undigested sludges from other wastewater treatment works to the THP plant on site for treatment and digestion. This imported raw sludge may also be subject to temporary storage in a dedicated bay on the cake pad pending transfer to the THP.

There is a new waste activity at the site for the operation of a cellulose recovery plant, which uses physical filtration to separate cellulose fibres from the incoming UWWTD materials delivered to the site by sewer for offsite recovery. This process has the benefit of improving process efficiency in the UWWTD treatment route at the site.

The installation is for the biological treatment of non-hazardous wastes by means of anaerobic digestion.

There is an import point for sludge transfers from other waste water works, for the THP. This material is transferred and blended with the indigenous sludge separated from the main aerobic treatment flow and site derived SAS (surplus activated sludge) prior to transfer to the THP. The THP imports may also be imported in sealed skips and stored temporarily on the cake pad within the works prior to transfer to the THP for treatment.

There are four SAS blending tanks used to ensure that the incoming materials are properly mixed to give a more homogeneous mixture, prior to transfer to the THP process. THP uses a combination of pressure and temperature to enhance the digestion of the sludge, in an enclosed system. From the THP, sludge is transferred to one of the primary anaerobic digesters located at the site. The digesters are above ground tanks and of concrete construction. The digesters operate on a continuous process basis, that is incoming sludge is added to the process as digested sludge is removed from the primary digesters. Removed sludge is transferred to digested sludge storage tanks to ensure that the required level of pathogen kill has been achieved. Following this, fully digested sludge is transferred to site dewatering equipment, where, following the addition of polyelectrolyte based coagulant, it is dewatered by centrifuge and stored on the sites open cake pad. Treated cake is removed from the pad for landspreading under the Sludge Use in Agriculture Regulations 1989, in accordance with the Biosolids Assurance Scheme (BAS). Dewatering centrate is subject to treatment within the LTP as described below.

Biogas is captured from the primary anaerobic digesters and stored within a dual membrane biogas storage holder or two gas storage vessels. The above ground biogas transfer pipeline is equipped with condensate pots that capture entrained moisture from the generated biogas and allow it to be drained into the site drainage system for treatment. The biogas storage vessels are fitted with pressure release valves (PRVs) as a safety precaution in the event of over pressurising the system.

The biogas is taken from the storage vessel for upgrading in a biogas upgrade unit and injected into the National Gas Grid. Biogas is also combusted in one of three CHP engines which are currently permitted under MCPD, generating electricity for use both within the site and for export to the grid, and heat to maintain primary digester temperature. Biogas can also be used in two package boilers. In the event there is excess biogas there are two emergency flares which are utilised under 10% of the year.

The new listed activity for a liquor treatment plant (LTP) at the works is linked to the operation of the listed anaerobic digestion plant for the treatment of sewage sludge and non-hazardous wastes. The treatment of non-hazardous wastes is undertaken in the same physical plant and there is no separation of outputs from the process. As part of the currently permitted activities, the installation includes a directly associated activity plant for the pre-treatment of sludge prior to either listed activity, by thermal hydrolysis (THP). The THP process is impacting on the ammonia concentration of the dewatering liquors produced within the process. Note the LTP is present and operational on the site and was not previously permitted due to a change in interpretation.

The new listed activity for the LTP at the site, which will reduce the ammonia concentration within the liquor by aerobic treatment, prior to the return of treated liquors to the works inlet. As this return is to the inlet as a liquid, it is a disposal operation, as following treatment within the urban waste water treatment directive (UWWTD) processes at the site, it is released to surface water in accordance with the requirements of a separately held discharge Environmental Permit.

In parallel to the LTP there is an ammonia recovery plant, which treats some of the dewatering liquors by chemical scrubbing to produce liquid ammonium sulphate. At present this is classified as a waste and is removed from site for disposal, but as part of the optimisation process for the plant, sampling will be undertaken to underpin an end of waste submission for this output in order to enable its beneficial reuse as a fertiliser.

An increase to the total throughput of the works is also requested due to a review of the Environment Agency understanding of the treatment of indigenous wastes, where additional import volumes are required to reflect these wastes streams within the installation and waste processes throughput. This increase relates purely to the recording of existing throughput.

The existing listed activity for the blending of imported hazardous wastes with indigenous sludges has been removed from the permit, as hazardous wastes will no longer be imported. There is no equivalent listing for the blending of non-hazardous wastes, meaning that the listing is to be removed. However, the physical infrastructure and operation of these blending tanks remains in place, for non-hazardous waste handling only.

This variation does not change the existing permit boundary which is the site fenceline and therefore includes activities which fall outside of the scope of this permit. A future variation is likely to involve reassessment of this boundary.

## 2. Technical Description

This application is for the substantial variation of the site's existing IED environmental permit under the Environmental Permitting (England and Wales) Regulations 2016 (as amended). It relates to the permitting of indigenous sewage sludge and imported sewage sludge and other wastes for treatment by anaerobic digestion for the Strongford Sewage Treatment Works, operated by Severn Trent Water Ltd.

The substantial variation to the permit is to amend an existing listed activity, the biological treatment by anaerobic digestion, of indigenous sewage sludge in a mixture with imported cess and septic tank derived wastes to reflect the treatment of non-hazardous wastes only. It removes an existing listed activity relating to the blending of hazardous waste with indigenous sludge prior to digestion. There is an additional listed activity added, for the operation of an existing liquor treatment plant (LTP) at the site, to aerobically treat process liquors prior to their return to the works inlet for full treatment. There is also the addition of a second listed activity for the recovery of ammonia by chemical stripping from some of the process liquors prior to their return to the works inlet for full treatment. These two additional listed activities operate in parallel, with some returns liquors being treated by each process. The LTP is an existing unit which has been operational for a number of years but was not previously identified within the permit. The ammonia recovery plant is a newly installed piece of equipment, which is being trialled at the works.

This variation retains the operation of biogas and natural gas fuelled boiler units for the generation of heat to the THP plant, in addition to permitted CHP engines at the site. These combustion plant remain as currently permitted. Biogas may also be treated through a biogas upgrading unit (gas to grid plant) which is within the current permit.

The site is currently permitted for a waste operation for the import of suitable liquids and thin sludges to the works inlet; and for a waste operation for the import of treated sewage sludge from other works for dewatering. There is the addition of a self banded import tank to temporarily store tanker imported wastes prior to treatment through the inlet, as well as clarifying that amongst the currently permitted imports, is raw sludge from other works, to the THP process.

There is the addition of a new waste treatment process that treats incoming urban waste water delivered by the sewerage network to the site, to recover cellulose in the form of cellulose fibres from part of the incoming UWWTD stream.

### Scope

This application covers the biological treatment of sewage sludge, both indigenous and imported from other waste water treatment sites, in a mixture with imported cess and septic tank derived wastes, by anaerobic digestion for recovery, with a capacity above the relevant thresholds. There is currently a listed activity for a blending tank where imported hazardous wastes, as well as interworks sludge transfers and indigenous sludges are blended; prior to transfer to the anaerobic digestion primary reactors. This activity is to be removed as only non-hazardous wastes are now imported and treated at the site. This means that the primary listed activities at the site will change from s5.3A(1)(a) activities to s5.4A(1)b activities.

Clarity is to be added that this import of non-hazardous waste would include raw sludge from satellite works to the THP. On occasion this raw sludge may be temporarily stored on the cake pad, in a separate, labelled, bay to digested cake. Raw sludge is stored for the minimum possible time period, pending THP availability.

The second existing listed activity for the treatment of hazardous waste by anaerobic digestion is to undergo a substantial variation to the same process but only treating non-hazardous wastes.

There is a new listed activity, for the operation of the existing LTP at the site, which aerobically treats process liquors prior to their return to the works inlet for treatment through the UWWTD route. This is classified as biological treatment for disposal. This plant has been on site and operational for a number of years and is being added to the permit due to a greater understanding that this operation is a listed activity in its own right.

There is an additional listed activity for the recovery of ammonia from dewatering liquors at the site, which is a new process which is undergoing operational trials. This is a physico-chemical treatment for the purposes of disposal (currently) which means the plant is a separate listing to the LTP. The ammonia recovery plant uses chemical scrubbing to remove ammonia from process liquors and operates in parallel with the LTP, so that process liquors are either treated by the LTP or subject to ammonia recovery. At present, the ammonia is recovered as ammonia sulphate which is stored as a liquid in tanks and transferred offsite by tanker for offsite disposal as it is classified as a waste material. As part of the process, samples will be taken for analysis to underpin a submission for 'end of waste' status for the ammonium sulphate to allow its removal from site as a product and input into agricultural fertilisers.

There are a number of directly associated activities at the site, including the operation of biogas fuelled CHP units for the generation of electricity and heat at the site, and operation of auxiliary boilers which remain as currently permitted. There are also a THP plant operation, clean up of biogas for injection into the gas grid, and storage of biogas undertaken as DAAs to the current permit.

The current permit includes two waste management activities, one for the import of hazardous wastes to the inlet for treatment through the UWWTD route. The permit also allows for the import of digested sludge to the dewatering plant, for dewatering prior to storage of the cake on the cake pad.

There is a change to the first of these waste activities, for the import of non-hazardous waste only to the inlet, to include the temporary storage of imported 'high strength' wastes in a self bunded tank at the inlet. In this context 'high strength' refers to parameters such as COD, BOD and ammonia concentrations, which can cause issues in the aerobic treatment processes on site if introduced at a high flow rate. The holding tank is designed to temporarily store these wastes and release them into the works at a lower flow rate than possible from a tanker, in order to minimise the risk to the aerobic processes on site.

This variation does not change the existing permit boundary which is the same as the wider site fence line. As such, the permit boundary includes activities that sit outside of this permit scope, as they relate to the UWWTD treatment route.

There is a change to one of the existing air emission points at the site to correct its location on the site plan, along with the addition of other air emission points associated with existing odour control units and pressure relief valves previously out of scope.

### **Site Setting**

Strongford sewage treatment works lies on the south side of the city of Stoke on Trent, just south of the settlement of Trentham and north of the settlement of Barlaston. The site is bordered to the immediate north by a golf course, with agricultural land to the east and south, before villages. The River Trent is adjacent to the western site boundary and then farmland. To the east of the site, there is a mixture of open farmland and properties along Barlaston Old Road.

The permitted area has two designated habitats sites within 2km of the site, namely Kings and Hargreaves woods, which has multiple units and is both a SSSI and classified as ancient woodlands, approximately 1 – 1.25km to the west (distance differs between the ancient woodland and SSSI) and another area of ancient woodlands, Newstead Woods, 1.1km to the north east. There are no local wildlife sites within 2km of the site. There are a number of patches of priority habitats, namely deciduous woodland, including two patches on the site boundary.

The site sits within the boundary of a Local Authority wide Air Quality Management Area (AQMA), which is designated for NO<sub>x</sub> (as NO<sub>2</sub>).

As the permitted area of the site includes the whole of the site within the fence line, the permitted area is mainly located within Flood Zone 1, that is, it has a less than 0.1% chance of flooding from rivers in any year. Most of the sludge assets are located within this Flood Zone 1, although some parts of the site, including the cake pad are within Flood Zone 3, where there is a higher risk of flooding from rivers (a 1% or more chance of flooding from rivers in any year) while some are within Flood Zone 2.

The site sits outside any source protection zone or surface water safeguard zone. The site is not in a nutrient neutral catchment.

The site operates 24 hours per day with the site being unstaffed overnight. A standby rota picks up process alarms overnight.

## **1 Application Basis - Waste Activities**

The waste activities comprise two existing activities and one varied waste activity.

The first waste activity comprises an offloading coupling for tankers and cess vehicles to discharge through, located at the works inlet into a covered, self bunded, holding tank. The waste permit variation will provide the works with additional protection from higher strength wastes (high COD/BOD), where wastes can be discharged into these tanks and then released into the main flow at a reduced flow rate. The site has installed an above ground self bunded steel tank adjacent to the current offloading area of 150m<sup>3</sup> total volume. Tankers offload at a set flow rate. By offloading higher strength wastes into these holding tanks, these wastes can be released into the main works flow at a reduced flow rate, enabling their treatment and reducing the risk to site processes. The tank can also be used to retard incoming tanker loads during storm condition periods, increasing the overall head room of the works during storm events. All tanker imports are subject to waste pre-acceptance and acceptance procedures which include being passed through a logger to record the incoming volume and the company carrying out the import. Once the tanker waste has mixed with the incoming UWWTD material, its treatment falls outside the scope of the Environmental Permitting Regulations.

The waste codes for imported waste accepted at head of the works are detailed in Form C3, Table C3-1bii. Once the tanker trade waste has mixed with the incoming UWWTD material, its treatment falls outside the scope of the Environmental Permitting Regulations. This activity is currently permitted and the existing permit incorporated into this variation. Note some of the imports are excluded from the scope of the permitted activities by the Controlled Waste Regulations 2012.

The site is currently permitted for a second waste activity, relating to the imported digested sludge from other works for dewatering at the facility using the plant on site and storage on the cake pad, pending application to land in the same manner as indigenous wastes. Imported sludge is kept separate from the indigenous digested sludge as far as practicable on site on an engineered cake pad. The waste codes for imported waste accepted at the installation for dewatering are detailed in Form C3, Table C3-1bii.

There is also a DAA for undigested sludge imports to the THP plant on site from other works for treatment, or in the event of abnormal operations at the THP, temporary storage at the site on the cake pad in a dedicated storage bay separate to any digested cake, pending further treatment. In the event raw cake is subject to temporary storage, the storage period is minimised as far as practicable and it is treated in preference to incoming sludge from other works. The import is currently permitted as a waste import activity but is included specifically as a point of clarification during the variation of the permit. The waste codes for imported waste accepted at the installation for treatment via the THP are detailed in Form C3, Table C3-1biii.

All imports to the site are subject to waste pre-acceptance and waste acceptance checks by Severn Trent staff.

There is a new waste activity at the site, which processes the incoming UWWTD flow to recover cellulose fibre from the bulk UWWTD. This is a new operation at the site and is not currently in use within England. This plant is described in more detail further on in this section, including a specific process flow diagram in Appendix A.

## **2 Installation Activities**

There is an offloading coupling for tankers to discharge UWWTD derived sludge from other waste treatment sites located at the facility. Sludge is passed through a logger to record the incoming volume of sludge and in is transferred to the Import Tank, with the imported sludge being blended with thickened indigenous SAS and indigenous primary sludges in one of two blending tanks. The Import tank is abated by a GRP 3000 Peacemaker OCU and ferrous is dosed into the blending tanks as required.

SAS from the UWWTD process is subject to SAS thickening in belt thickeners before it is pumped to the blending tanks and mixes with the imported sludge and indigenous primary sludge. SAS thickening is subject to odour abatement via an OCU consisting of three biofilters followed by a GRP 6000 Peacemaker.

Thickened SAS, Primary Sludge and liquid imports are all brought to the centrifuges on the THP. They are centrifuged here and sent forward to the THP for processing. The centrate from the pre THP centrifuges is sent to liquor treatment plant balancing tank. We also send final dewatering centrate to the balancing tank and mix the two centrates together for processing via the liquor treatment plant. The effluent from the liquor treatment plant can be directed into two places. It can either go to the ASP distribution chamber or to head of the works depending on the quality of the effluent. The head of the works location is just prior to the screw pumps which distribute the flow to the PST's, this is post storm separation.

SAS filtrate from SAS thickening first enters a well, in this well there are two routes, one side goes before the inlet, the valve to this side is kept closed and the other side goes to the same place as LTP returns, the screw pumps prior to PST distribution.

Blended, dewatered sludge from the blending tanks is transferred for pre-treatment in the THP plant to hydrolyse sludges prior to anaerobic digestion. There are two THP streams and each stream is comprised of a pulper, four reactors and a flash tank, plus ancillary units. The pulper receives recycled steam from the flash tank, raises the temperature to 100°C and feeds homogeneous sludge forward into the reactors. Once filled in batch sequencing with sludge and steam, elevating the temperature to 160°C and 6 bar, each reactor is sealed for 20 to 30 minutes to allow for pathogen kill before flashing into an atmospheric pressure tank.

Steam for the THP is generated using two on site boilers, a dual fuel boiler (biogas and natural gas), and a heat recovery steam generation (HRSG) boiler which recovers heat from the exhaust of the CHP engine.

The currently permitted THP process, improves the gas yield from anaerobic digestion, by using increased temperature and pressure to pre-treat sewage sludge, to break down larger organic molecules and structures. Operation of the THP has shown that the dewatering centrate from the treatment of the digested sludge cake has elevated ammonia concentrations. Where ammonia concentrations are too high, they can lead to inhibition of the aerobic processes within the UWWTD treatment route on site.

As part of the import of raw cake to the THP for treatment, there may be occasions where raw cake is imported in wagons and stored on a separate cake pad within the works on a temporary basis, pending transfer to the THP for treatment.

### **3 Ceased Operations**

The site no longer accepts hazardous wastes for treatment. This means that the listed activity for blending hazardous and indigenous wastes is no longer applicable. However, this operation is still undertaken for non-hazardous waste imports being blended with indigenous sludges prior to the THP. This is a DAA rather than a listed activity due to the wording of the regulations.

### **4 Anaerobic Digestion Process**

Following THP treatment, sludge is transferred via pipework to one of six above ground anaerobic digesters which are of concrete construction with steel roofs. These digesters are in two sets of three with regards to volumes. Each of the primary digesters are fitted with two pressure relief valves (PRVs), which operate in an emergency only. The digesters operate on a continual basis with incoming sludge added to the process as digested sludge is transferred to one of the two digested sludge storage tanks at the site prior to dewatering.

The digesters will now be operable in parallel mode, where the feed is equally split to digesters operating independently of each other, or in series mode, where digesters are arranged in sequences to transfer sludge between them for digestion.

Series mode, using a proprietary control scheme called "EPHYRA", amends the filling and transferring process currently utilised in the digesters to a progressive fill and transfer of sludge in the digesters in sequence. The movement of sludge will be controlled by pumps between the digesters.

In two banks of three digesters, feed sludge is fed into the first digester in a sequence by a feed pump. The sludge is then withdrawn from the first digester and pumped to the next digester. This continues until the sequence is complete, dependent on the number of digesters in service. There is a pumped recirculation of sludge from the final digester to the first to maintain digester performance. All digesters can be taken out of service as current for inspection or repairs in this mode.

The two banks operate independently of each other. The sludge is held within each digester sequence for the period specified by the site's HACCP (hazard and critical control point) plan for sludge use in agriculture regulations.

In series mode, the digested sludge will be pumped from the final digester in series to a digested sludge storage tank. The digested sludge will now be stored in what was Digester 2 (covered, concrete tank), as this tank was made redundant as a digester once THP was commissioned at site. This process continues to operate on a continual basis with incoming sludge added to the process as digested sludge is transferred to the dewatering centrifuges. The current two digested sludge storage tanks are becoming contingency storage only. This is required as a safety mitigation for if the pumped withdrawal of sludge is interrupted and the digester level increases without the level control measures responding. Digested sludge can also be imported to the digested sludge storage tanks and mixed with indigenous sludge.

Digested sludge from digested sludge storage tank (former Digester 2) will be progressed to an installation of a vacuum methane degassing equipment. This is installed to recover entrained biogas from the digested sludge with the intention to reduce the emissions released during cake storage and centrifuge operation. This gas will be connected to the digester gas collection line. There are two "ELOVAC" units. These can be bypassed if required based on equipment operation, this bypass is controlled by software. There are vent points from the system in the emergency requirement to release gas from the system to prevent explosions.

The digested sludge is then mixed with a polymer coagulant and dewatered on site. Digested sludge dewatering operations are abated by an OCU which consists of a biofilter followed by a GRP 2000 Peacemaker. The liquor is then subject to treatment within an existing Liquor Treatment Plant (LTP) or the ammonia recovery plant which operate in parallel and the outputs from both are returned to the head of the STW for aerobic treatment via the UWWTD treatment route.

## **5 Cake Output**

The sludge cake is transferred to an open, engineered cake pad following dewatering. The sludge is analysed to check compliance with Sludge Use in Agriculture Regulations (1989) (SUiARs), in accordance with the Biosolids Assurance Scheme (BAS) and once the sludge is confirmed to be compliant it is removed from site for land spreading.

## **6 Biogas**

The site has two separate DAA's for use of captured biogas.

The anaerobic digesters will now be operable in parallel mode, where the feed is equally split to digesters operating independently of each other, or in series mode, where digesters are arranged in sequences to transfer sludge between them for digestion.

Series mode, using a proprietary control scheme called "EPHYRA", amends the filling and transferring process currently utilised in the digesters to a progressive fill and transfer of sludge in the digesters in sequence. This ensures a more consistent and treated digestate output. The movement of sludge will be controlled by pumps between the digesters.

Digested sludge will now be transferred to the repurposed Digester 2, now a digested sludge storage tank, then dewatered using 3 No centrifuges. The 2 former digested sludge storage tanks will be for contingency use only. Residence time for sludge in the digested sludge storage tank is not fixed as they are primarily for balancing flows to the centrifuges.

Digested sludge from digested sludge storage tank (former Digester 2) will be progressed to an installation of a vacuum methane degassing equipment. This is installed to recover entrained biogas from the digested sludge with the intention to reduce the emissions released during cake storage and centrifuge operation. This gas will be connected to the digester gas collection line. There are two "ELOVAC" units. These can be bypassed if required based on equipment operation, this bypass is controlled by software. There are vent points from the system in the emergency requirement to release gas from the system to prevent explosions.

Biogas is captured from the primary digesters, the new methane vacuum recovery system (ELOVAC) and transferred for storage in a double membrane gas bag and two gas storage vessels. The biogas transfer lines are equipped with condensate pots to remove entrained water from the biogas. The line from the gas bag is equipped with a siloxane filter to remove siloxanes from the biogas prior to utilisation.

Biogas is preferentially transferred to the biogas upgrading plant on the site for injection into the national gas grid close to the site. This is a currently permitted as a DAA to the digestion processes on site.

There is also currently permitted combustion plant for the thermal treatment of biogas at the site, which includes the supply of heat and steam to the THP plant. This comprises 3 Combined Heat and Power (CHP) units and 2 boilers. Electricity can also be exported to the National Grid when there is excess supply above the site needs. The permitted CHP units and auxiliary boilers on site are either "existing" medium combustion plant (MCP) as defined by Schedule 25A of the Environmental Permitting Regulations (EPR) 2018, in that they are less than 20MW thermal and were commissioned prior to 20 December 2018, or they are permitted as medium combustion plant already. The CHP units also fall under the definition of Specified Generators under Schedule 25B of the EPR 2018.

There are also two existing, permitted, emergency flares located at the site. One provides an outlet for excess gas from the CHP engines that can combust biogas when there is excess biogas that cannot be combusted by the CHP or when the CHP is offline for maintenance. The other flare supports the biogas upgrading plant and is used when upgraded biomethane cannot be injected into the national gas grid e.g. if there is a quality problem with the upgraded biomethane.

## **7 Liquor Treatment Plant**

The new listed activity, is for an existing liquor treatment plant (LTP) at the site to treat liquor generated by the dewatering of treated digested sludge at the site, which will reduce the ammonia concentration within the liquor by aerobic treatment, prior to the return of treated liquors to the works inlet. As this return is to the inlet as a liquid, it is a disposal operation, as following treatment within the urban waste water treatment directive (UWWTD) processes at the site, it is released to surface water in accordance with the requirements of a separately held discharge consent Environmental Permit.

The LTP is an Amtreat plant, aerobically treats centrate arisings to reduce the ammonia loading, to minimise the risk of process inhibition. This is therefore, a biological treatment process where the outputs are sent for disposal.

The Amtreat plant uses aerobic treatment processes to reduce the ammonia loading by reduction to nitrates and nitrites, which are returned to the works inlet for further treatment. The plant is located within the existing permit boundary. Due to the nature of the aerobic process, the tanks are open topped to ensure sufficient oxygen is present for operational efficiency. The plant has two reactor tanks, each of above ground steel construction and approx. 1500m<sup>3</sup> capacity. There are a number of raw materials utilised within the process which have been added to the site inventory.

## **8 Ammonia Recovery Plant**

There is a new listed activity for the operation of an ammonia recovery plant. This plant is operated in parallel with the LTP, at the site. Dewatering liquors are split between the two plants, and both treat ammonia in a different manner, returning their process outputs to the works inlet for further treatment through the UWWTD processes on site. The ammonia recovery plant is a chemical scrubber based system and is therefore, a separate listed activity to the LTP which is a biological treatment process.

The ammonia recovery plant is designed to removed ammonia from the incoming dewatering liquors, using chemical scrubbing to produce an output of ammonia sulphate. Currently this is to be removed from site as a waste material. However, as part of the optimisation process, the ammonium sulphate will be analysed in order to provide data to underpin an 'end of waste' submission. Once this material is deemed a non-waste, it will be removed from site for use as a liquid fertiliser. At this point, the permitting status of the plant will be changed.

The plant is a ByoFlex unit manufactured by Nijhuis. It is designed to reduce the ammonia concentration in dewatering liquors by approximately 75-85% using a mixture of minimal heating (thermal stripping) and chemical scrubbing to produce liquid ammonium sulphate. The plant installed is designed to process approximately 30m<sup>3</sup> per hour (approximately 720m<sup>3</sup> per day; initially 240m<sup>3</sup> per day – see later for operational hours)

The plant comprises three columns, which operate in series. In the first column, the incoming effluent is subject to air stripping including the application of heat to help volatilise the ammonia from the liquid to the gaseous phase. The liquors are introduced from the top of the column and the air is introduced from the base, with the ammonia enriched air being captured from the top of the stripping column. This ammonia enriched air is then passed through two chemical scrubbers, where it is treated with sulphuric acid and water, to form ammonium sulphate. The sulphuric acid is transferred by pipeline from an adjacent bunded tank, which has been designed and manufactured for the purpose as acid proof. The concrete surfacing by the plant has been suitably treated with acid resistant paint to minimise the risk of concrete damage in the event of any drips or spills during tank filling operations.

The air from the scrubbing process is recirculated back into the first air stripping column with additional air input as required due to any process losses due to air absorption into the bulk liquors passing through the columns. The liquid ammonium sulphate produced in the plant is captured from the base of the scrubbers and transferred to an adjacent bunded tank, by pipeline from where it is removed from site by tanker.

The plant is currently being trialled and optimised at the site as this is a new process within sewage treatment works in the UK. As such, process heat is currently being supplied from a small (approx. 0.6MWth) diesel powered hire boiler. It is intended to fuel this unit with HVO during the trial. In the event the trial is successful and moves to full implementation, a permanent heat source will be provided. At present, no air emissions modelling has been undertaken on this plant, due to its temporary nature. The existing air dispersion model included all 3 existing CHP units and the 2 boilers which are permitted at the site, with all units operating at 100% load, 100% of the year. A technical note has been provided by an air quality specialist around how operational loads are lower and therefore this plant will be accommodated within the existing total emissions from the site on a site emissions envelope basis.

Although the plant is designed to operate 24-7, as this plant is in the trials and optimisation phase, it will be operated 8-4 Monday – Friday initially to ensure that operations can be fully monitored.

### **9 Cellulose Recovery Plant – New Waste Activity**

Materials delivered to a sewage treatment works by the sewer network, are defined as urban waste water and therefore, covered by the urban waste water treatment directive (UWWTD) (91/271/EEC). Materials falling within the scope of the UWWTD are excluded from the legal definition of waste, as defined by the Waste Framework Directive (EC/2008/98).

Urban waste water contains entrained cellulose from paper based products including toilet paper. Under normal operational conditions at sewage works, some cellulose is removed from the UWWTD stream within the primary

settlement tanks (PST's) which is treated onwards through the anaerobic digestion process, the majority is treated within the activated sludge process (ASP) at the site.

Due to celluloses chemical structure, which is effectively a long linear organic chain, it is difficult for biological process to break it down under either aerobic or anaerobic conditions and this leads to either cellulose remaining within the sludge cake from the anaerobic process, or additional energy requirements in the ASPs in order to reduce the total suspended solids (TSS) and Chemical Oxygen Demand (COD) at the works, in accordance with the sites final discharge permit.

By removing the cellulose fibres from the bulk UWWTD influent, it is hoped to reduce energy requirements at the site as part of Severn Trent's Net Zero Hub demonstrator project for emissions reduced wastewater treatment through a reduction in biological treatment related emissions.

A percentage of the total UWWTD works flow is conveyed to a bank of 'CELLCAPs®' which undertake the cellulose separation. The site has a total of 10 CELLCAPs®, which operate in pairs, in parallel, with the available flow determining how many pairs of CELLCAPs® are online at one time. CELLCAPs® may only be operated as pairs, although waste water is only processed in a single unit. Should the works flow exceed the optimal flow for the CELLCAPs®, there is a bypass line present to allow waste water to be handled as at present without entering the CELLCAPs®.

Each CELLCAP® comprises a drum screen, (CellWash), which uses rotating fine mesh drums to separate larger contraries that cannot be treated in the process, such as hair, leaves, and fragments of plastic from the cellulose and bulk waste water mixture. These contraries are transferred back into the main UWWTD flow for treatment primarily through the sludge stream at the works. The cellulose and waste water mixture is passed to the 'INTENSIEVE®' which is an angled washed screen arrangement. The waste water, including most of the sewage related solids, are passed through the screens and transferred back into the main works flow, where they are treated as at present. The longer cellulose fibres are captured on the moving screens which are equipped with a mesh of long thin holes, to capture cellulose while smaller organic molecules can pass through this mesh. The screens are subject to cold washing with soap enrichment followed by hot water washing, to remove as much easily degradable organic material as possible. Compressed air is applied to the screen to remove cellulose from the screens, where it is transferred to a screw conveyor.

Once cellulose has been transferred to the screw conveyor, it is handled in a bulk mixture with the outputs from all of the other currently operational CELLCAPs®. The screw conveyors transfer the separated cellulose to plate presses called CELLPRESS®, which results in a cellulose output with approximately 35-40% dry solids. All removed liquids are returned to the works for treatment through the aerobic treatment processes.

The pressed, partially dried cellulose is passed to the drier and hygienater, which both use heat to remove additional water from the separated cellulose, to give a dry solids content of up to 90%. The hygienater uses heat at approximately 70°C to pasteurise the cellulose and kill entrained bacteria. Following this additional drying, the cellulose is transferred to a skip or covered container prior to offsite recovery.

There are no new thermal processes required for the process to operate. Hot water is supplied from the existing site boilers and the drier and hygienater thermal inputs come from heat exchangers and electrical heating.

### **9.1 Capacity**

The full scale installation at Strongford will produce 4T/day of dried cellulose. The skips to store the cellulose will be collected daily by the carrier. Annually this would equate to  $365 \times 4 = 1460$  T a year.

### **9.2 Appropriate Measures Assessment for Cellulose Recovery Plant**

Although the majority of sewage processes fall within '*Biological waste treatment: Appropriate measures for permitted facilities*', no biological treatment of the waste is undertaken under this permitted activity.

The treatment process undertaken, comprises physical treatment, through sieving, separation and compression. Although soap is used in the washing stage, this is not chemical treatment of the waste. Therefore, it has been assessed that the relevant Environment Agency guidance document is '*Non-hazardous and inert waste: appropriate measures for permitted facilities*', updated 1<sup>st</sup> August 2023.

The site is fully compliant with the requirements of Section 2 on General Management, it operates under a CMS (certified management system) and the organisation hold ISO14001 at the location. The site has an accident plan and associated contingency plans, including those designed into the plant.

Section 3 is not applicable for the site due to the nature of the waste inputs. The site is treating material that is delivered to site within the urban waste water flow, which is therefore, not subject to waste pre-acceptance or acceptance checking beyond the routine monitoring of the inlet quality. Section 4 is not applicable to the site as there is no waste storage within the permitted process.

Section 5 on waste treatment, is met in full for the general points, but subsections 5.1; 5.2 and 5.3 are not applicable to the waste under treatment.

Section 6 is met as far as applicable to the process. The CELLCAP® units are enclosed, as are the screw conveyors and heating processes, with a vent to air. There are no fugitive emissions to air, land or water. There is a direct emission to sewer of urban waste water from which cellulose has been removed, which is treated within the wider sewage treatment works. There is no changed risk of pests or vermin associated with the process.

Emissions are managed and monitored in accordance with the relevant aspects of section 7. Section 7.2 is not applicable as there are no medium combustion plant within this permit. Section 7.1 focuses on dust emissions, which are not produced by the process due to the nature of the waste treated. Section 7.3 is monitored outside of this permit, as part of routine monitoring of the works inlet. As no chemical changes are made within the process, the inlet data remains relevant.

Section 8 is not applicable to waste environmental permits. However, the energy use within the process is monitored and its impact on the site wide energy use is also reviewed as part of the 'net zero' hub. Section 9 is complied with and under constant review. An assessment is underway to review data as part of an 'end of waste' submission for the separated cellulose.

The site is subject to Odour Management Plan, which has been updated to reflect this activity. The relevant activities managed under this permit are highlighted within the document.

### **9.3 Technically Competent Management**

After commissioning of the plant, it will be operated and maintained by internal staff at Severn Trent who's competence is captured by our current CMS under EU Skills accreditation. Strongford site team are already trained to the current scope of the CMS, but the additional activity will be brought into scope within 12 months of the permit being issued (as per EA guidance 'Legal operator and competence requirements: environmental permits').

### **9.4 Noise and Odour**

Please see the updated appended OMP in Appendix F which applies to the whole site.

The facility has the potential to generate noise as a result of the permitted activities. Potentially noisy activities are subject to a number of process controls and noise management is a key operational objective, as summarised in the risk assessment table below. The EA Noise Advisory Tool has been undertaken, the results of this showed that no noise impact assessment or noise management plan was required.

### **9.5 Point Source Emissions**

There is only one exhaust point of the air. The air emission point from the drier is shown as point A27 on the revised site plan. This is located at point SJ 8805 1 39405. The discharge point from the cellpress back to the wastewater flow is at grid reference SJ 88032 39399, shown by point T3 on the revised site plan.

The drier circulates about 30000 m<sup>3</sup>/h of air, the max emission is 10% of that (3000 m<sup>3</sup>/hr). The saturated air within the drier, flows through a condenser, where it is cooled, resulting in moisture condensation and heat recovery. Subsequently, the dehumidified air is reheated. If too much heat (energy) is generated in this process, up to 10% of the air is refreshed (i.e. released and fresh air drawn in). Therefore, process air is not exhausted

continuously, especially when heat losses are minimal (e.g. during summer). When air is released, is passed through an activated carbon filter to remove any odours.

### **9.6 Returns Data**

Water emissions are to be returned back to the works inlet for processing through the UWWTD route at the site. Note that due to the nature of the UWWTD derived materials being classed as non-source segregated, it is not possible for Severn Trent to determine the potential contaminants present in the returns prior to the cellulose plant becoming operational.

At present, Severn Trent Water is working with commercial laboratories to identify the best way to carry out this sampling to obtain the necessary determination limits set within the appropriate Environment Agency guidance. This work is being undertaken to respond to improvement conditions within the IED permits for Severn Trent's IED permitted works, which have similar process returns back to the inlet for treatment through the works. A H1 model has been prepared based on available data from a proxy site, but a full 12 months of data has yet to be gathered.

Severn Trent would like to propose a similar improvement condition is used in this case.

### **9.7 Recovery routes**

At present, there are no firm, contractual routes for the recovery of the cellulose in place, due to a lack of material to take to market. Proposed end markets will also be dependent upon an end of waste agreement being made for the output.

Potential options, based on outputs from European plants, include inclusion as fibres in asphalt to enhance flexibility; as a carbon source for the manufacture of PLA (polyactic acid); and as a feedstock for biopolymers.

## **10 Permitted Works Throughput**

An increase to the total throughput of the works is also requested due to a review of the Environment Agency understanding of the treatment of indigenous wastes, where additional import volumes are required to reflect the waste streams within the installation and waste processes throughput. Note that although the treatment volume has increased due to the inclusion of the throughput of the LTP, this liquor is currently within the volume being handled by the installation. This increase relates purely to the recording of existing throughput.

The ammonia recovery plant throughput stated sits within the total throughput of the LTP as the two processes are in parallel, with dewatering liquors being diverted from the LTP to the ammonia recovery plant.

Although values are given for the cellulose recovery plant, this treats UWWTD material delivered by sewer which sits outside the volumes within the wider permit.

## **11 Process Monitoring**

Anaerobic digester operations are monitored automatically from the control centre at the site and outside of normal operational hours, from the regional control centre. Checks include digester health, temperature and operation, including for the presence of foaming, which is treated with anti-foam as appropriate. All tanks are equipped with appropriate high-level alarms and automatic cut off valves to minimise the risk of overtopping. Site operations are covered by Severn Trent's ISO14001 accreditation for all operations, and technical competence is provided by the organisations CMS and training program.

## **12 BAT Assessment**

A full assessment of the relevant sections of the Waste Treatment BRef are supplied as Appendix D for the listed activities at the site.

## **13 Containment**

The existing site infrastructure is not currently fully compliant with the requirements of BAT, specifically with regards to containment and surfacing. A spill risk assessment and proposed outline containment solution, in accordance with CIRIA 736 is supplied as Appendix E.

The outline containment solution for the two containment areas features flood gates for both areas. However, as part of the refinement of the design towards design implementation it is hoped to eliminate these gates.

#### **14 Open Topped Tanks**

There are a number of open top tanks within the permit boundary at Strongford, primarily the digested sludge storage tanks. It is acknowledged that there may be emissions of biomethane and/or odour from some of these tanks, and Severn Trent as part of its agreed IED compliance plan, has committed to cover open topped tanks at the site and either transfer captured biogas to the biogas system, or to an appropriately designed and sized OCU. In the case of the digested sludge storage tanks, this will depend on the effectiveness of the Elovac system, which will determine if there is sufficient biogas present to warrant transfer to the biogas system.

#### **15 Liquor Returns Monitoring**

There are no direct emissions to water from the sludge treatment facility. The only indirect emission is of the sludge dewatering and thickening liquors and surface waters, which are returned to the wastewater treatment works for aerobic treatment under Urban Wastewater Treatment regulations. The liquors returned from the sludge treatment facility have originated from wastewater treatment works that are also under the control of Severn Trent Water.

Site drainage from operational areas is captured within the site wide drainage system and returned to the head of the works for treatment within the UWWTD treatment route. Site drainage plans are included within Appendix A. The liquor returns to the wider works, are treated through the UWWTD route. This comprises primary treatment via screening and settlement; secondary treatment in an activated sludge process and tertiary treatment by sand filtration if required.

No specific substances have been added to the effluent based on a review of the chemical safety data sheets for the chemicals used within the processes on site.

However, there is a likelihood that specified substances are present within the effluents handled, which include both tanker trade imports to the inlet and UWWTD materials delivered by sewer, which may include specified substances from households, trade effluent discharges into the sewerage network, road and hard standing runoff and unconsented releases from commercial and industrial premises.

At present, Severn Trent are starting to collect effluent data from works in order to undertake appropriate H1 screening and modelling, if necessary, based upon the outcome of the H1 screening tool. There is currently a backlog in receiving data from UKAS accredited commercial laboratories and therefore, no site currently has a full 12months of data available. In addition, some processes on site at Strongford are not currently in operation within the UK and therefore, detailed effluent analysis is not available even from a proxy site, as plants within mainland Europe will handle a different effluent composition.

Indicative H1 modelling has been undertaken on limited proxy data from similar Severn Trent sites as far as possible, i.e. data is from a site equipped with a THP rather than conventional anaerobic digestion.

#### **16 Liquor Returns**

Site drainage from operational areas is captured within the site wide drainage system and returned to the head of the works for treatment within the UWWTD treatment route. These returns enter the inlet after the storm offtake and therefore, cannot bypass onsite treatment via the UWWTD route. Site drainage plans are included within Appendix A.

#### **17 Other Considerations**

The site has an odour management plan which is supplied as Appendix F.

The cake pad at the site is over 250m from the nearest offsite receptor.

All electricity generating plant on site is currently permitted and not subject to any revisions as part of this application. Therefore, there is no requirement to undertake a decarbonisation assessment.

There is no requirement for a fire prevention plan at the site, due to the nature of the wastes treated and the processes utilised, in accordance with Environment Agency guidance.

### 18 Tank Inventory

Tank Type	Number	Volume (each) (m <sup>3</sup> )	Construction
Digesters	3	2900	Concrete
	3	2540	Concrete
Digested Sludge Storage Tanks (existing – to be contingency only)	2	3500	Concrete
New digested Sludge Storage Tank (formally Digester 2)	1	2500	Concrete
Blending Tanks	4	540	Concrete
ELOVAC units	2	8	Steel
Import Tank	1	150	Concrete
SAS buffer tank (not included – unthickened)	1	130	Steel
LTP Tanks	2	1,500	Steel
Sulphuric acid tank	1	30	Steel
Ammonium sulphate tank	1	50	Steel
Inlet Holding Tanks	1	150	Steel

### **3. Application Form Questions:**

#### **3.1 Form C2**

##### **1 About the permit**

###### **1a Have you spoken to the Environment Agency already about this application?**

Yes. This application is to update the existing permit in accordance with the IED and Regulation 61 submission for the site, and updates earlier supporting documents submitted. The key previous updates are as below.

An Enhanced Pre-application Advice ref: EPR/MP3097FY/P001 was issued on 28<sup>th</sup> February 2025. A nature and heritage conservation screening assessment was issued on 18th April 2024, ref: EPR/MP3097FY/P002.

An application was made in April 2024 and updated in June 2025. This application was originally for a standalone permit, but has been included within the scope of this application.

###### **1b If we have agreed you can send application information in stages**

Not applicable.

###### **1c Permit number**

EPR/MP3097FY/V005

###### **1d Site details**

Severn Trent Water Limited  
Strongford Sewage Treatment Works;  
Barlaston Old Road,  
Barlaston,  
Stoke-on-Trent,  
ST12 9EX.  
SJ 87925 39070

###### **2a Type of variation**

This application relates to a substantial variation.

###### **2b.1 Changes or additions to existing activities**

This substantial variation applies to both listed activities at the site and is for the:

- Biological treatment by anaerobic digestion of non-hazardous wastes for recovery or recycling only;
- Addition of a new listed activity at the installation, to add an existing liquor treatment plant to treat liquor generated by the dewatering of treated digested sludge at the site, in order to reduce the strength of the liquor returned to the head of the works;
- Addition of a new listed activity for the physico-chemical treatment of dewatering liquors from treated digested sludge at the site, to recover ammonia from the liquors;
- Removal of the listed activity for the blending of hazardous waste prior to treatment at the site. Note that the infrastructure for this activity remains in use at the site, the removal of the listing is due to there being no equivalent listing relating to non-hazardous waste;

- Clarification of the scope of the current directly associated activity to include sludge imports to the THP plant on site from other works;
- Clarification of EWC codes for different activities at the site;
- Clarification of all process throughputs to include indigenous arisings;

In addition, the waste activity at the site will be varied to include:

- Addition of a self bunded, covered, holding tank at the works inlet, to enable imports to be retained prior to release into the main treatment flow;
- Addition of a cellulose recovery plant to recover cellulose fibres from incoming urban waste water.

## **2b.2 Provide further details of your proposed changes or additions in a separate document**

Please see technical description

## **2b3 Do you want to remove an activity from your permit?**

Yes, please see previous text.

## **2c Consolidate (combine) two or more permits into one**

No

## **2d Consolidate (update) a single permit**

### **2d.2**

I am applying to update and modernise my permit

## **2e Low impact installations (installations only)**

### **2e.1 Will the changes mean the facility qualifies as a low impact installation?**

No

## **3 Your ability as an operator**

### **3a Relevant offences**

#### **3a1 Have you, or any other relevant person, been convicted of any relevant offence?**

No, according to the guidance on spent convictions.

### **3b Technical ability**

#### **3b.1 Which technical competence scheme are you using?**

*Tick the scheme(s) you are using to demonstrate your technical competence.*

EU skills/ESA.

Severn Trent Water utilises a competence management system to demonstrate technical competence at the site. The current management system is integrated where possible with our ISO14001 EMS, and comprises of written Scope, Policy, Objectives and Targets, Roles and Responsibilities, Competence and Training, Communication, Performance Monitoring and Measuring, Internal Audit, Non-conformance procedure, Legal Requirements, Record Control, and Management Review. Please see the appended CMS certificate, which has a scope including waste storage and treatment. Our CMS certification, under the Environmental Services Association/Energy and Utility Skills (ESA/EU skills) competence management scheme, has been held continuously since the scheme's inception in 2012.

#### **3b.3 EU skills/ESA scheme**

*Provide evidence of technical competence.*

The CMS certificate, which includes this site is presented in Appendix B.

### **3c Finances**

**Installations, waste operations and mining waste operations only.**

**Do you or any relevant person or a company in which you were a relevant person have current or past bankruptcy or insolvency proceedings against you?**

There are no current or past bankruptcy or insolvency proceedings against the applicant.

### **3d Management systems**

Yes, we can confirm that this is the case.

**What management system are you providing for your regulated facility?**

The Company holds BS EN ISO 14001:2015.

Please send us a summary of your updated management system and a copy of your accreditation (if applicable) with your application.

Please see **Appendix B** for EMS and CMS certificates.

### **Scope**

Severn Trent Water operates an Environmental Management System certified to ISO14001:2015. The certified EMS scope covers "Management and delivery of wastewater treatment processes. Transfer and storage of highway waste on depots. Tankered Waste Imports, Sludge Treatment and associated Biogas activities. Mothballed landfill monitoring activities. Head office functions at Severn Trent Centre."

### **Environmental Policy**

Implementation of the Severn Trent Water's Environmental Policy is approved by the Severn Trent Executive Committee of the Severn Trent Plc Board and is the responsibility of all employees, with the Chief Executive being accountable for its implementation. The policy covers all Severn Trent activities, including this installation, and applies to all individuals who are employed by, or carry out work on behalf of, any Severn Trent group company including contractors, temporary staff and agency workers. The Integrated Management Systems Team (EMS specialists) is responsible for the implementation of the EMS, the site operations teams will be responsible for maintaining ongoing compliance and managing the sites.

<https://www.severntrent.com/about-us/governance/our-policies/>

### **Management and Responsibilities**

The Integrated Management Systems Team (EMS specialists) has overall responsibility for the management and upkeep of the EMS. Compliance with specific elements of environmental legislation is managed by the relevant Business Areas across the Company. The Integrated Management Systems Team (EMS specialists) maintain a Legal Register and, in consultation with Operational Teams, the Environmental Permits team and other relevant business functions and specialists, assess environmental risks for in-scope areas using a significance scoring method under normal, abnormal and emergency conditions. Significant environmental aspects and impacts take into account legal and other requirements, cost to the business, scale of impact and interested parties.

The Integrated Management Systems Team (EMS specialists) are responsible for setting internal environmental standards with Standard owners which are then implemented by the relevant business areas. The standard operating procedures and other relevant information are communicated through a number of routes and stored on a central repository. Incident and corrective action processes are in place to promote continual improvement.

Local operating procedures are the responsibility of the operational teams that operate the activities.

The defined roles and responsibilities are allocated to relevant personnel, depending on their job description, qualifications, knowledge, experience and training. Training and competency are role specific.

Management Systems Team (EMS specialists) are responsible for setting internal environmental standards with Standard owners which are then implemented by the relevant business areas. The Standards and other relevant information are communicated through a number of routes. Incident and corrective action routes exist to promote continual improvement.

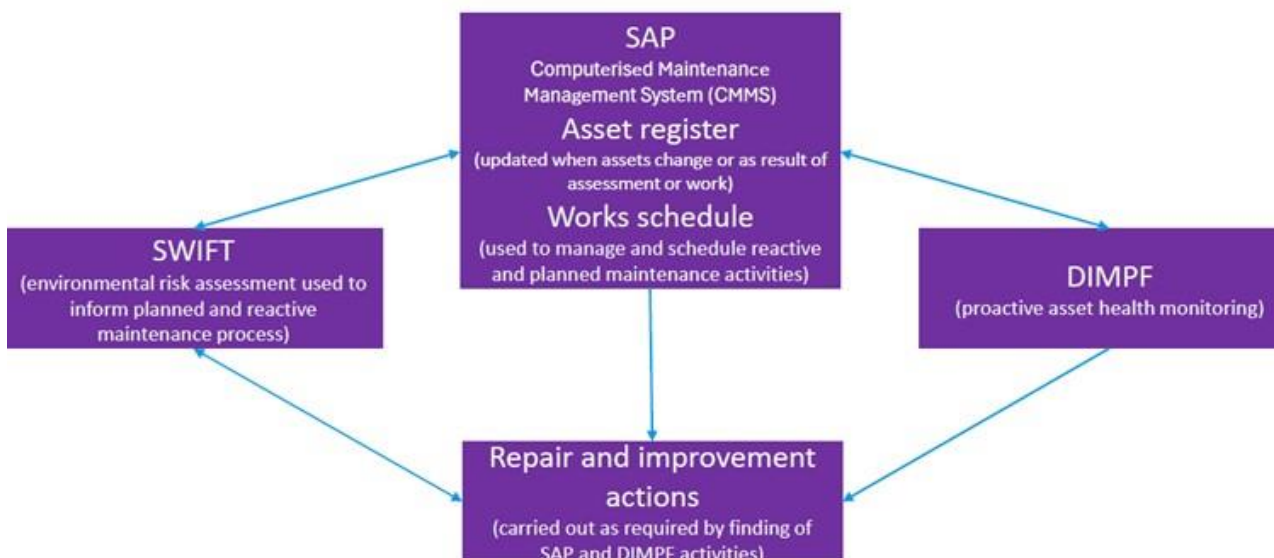
Local operating procedures are the responsibility of the operational teams that operate the sewage works.

The defined roles and responsibilities are allocated to relevant personnel, depending on their job description, qualifications, knowledge, experience and training. Training and competency are based on specific roles.

**Operational Control**

Procedures are in place to identify and control environmental issues arising from Severn Trent Water activities. Each department is required to achieve operational control of its activities and identify and record any departmental environmental issues. The DIMPF model is utilised on this site (Design, Installation, Maintenance, Potential Failure, Functional Failure) to ensure proactive asset management.

**ASSET MODEL INTERACTION**



Routine sewage treatment operations and activities are recorded within the corporate management database, SAP. These include routine inspections, monitoring and maintenance tasks. Systems are in place to enable both proactive and reactive asset care and maintenance.

Non-routine activities, such as major overhauls/refurbishments, which involve the use of sub-contractors are assessed for health, safety and environmental risks and method statements are produced to address these, as part of the Managing Contractors process. Contractors who are required to carry out major services are closely

managed by the team to ensure that compliance with Severn Trent Water's H&S and environmental policies is achieved. No contractors may work on site without having undergone a full site induction.

Processes on site operate continuously, 24-hours per day, 7-days per week, apart from maintenance periods. The plant is designed to operate unattended with process parameters being monitored continuously. Operating logs are stored electronically.

### **Maintenance and Monitoring**

Management will have the ultimate responsibility for the effective maintenance of plant throughout the company. The facility has named staff that are responsible for day-to-day maintenance operations and contractors are also used as required. The following basic inspections and maintenance activities are carried out on site:

Daily operation of plant (24/7) involves visual inspection of operational assets;

Daily inspection of temporary pipe work installed;

Weekly visual inspections of the bulk oil storage tanks and the oil pipework (visual check on above ground pipework);

Monthly inspection of all bunds (oil, transformer, temporary, etc.) and condition of containerised engines;

Routine maintenance programme for plant; and

Routine lubrication programme.

Personnel responsible for the inspection, testing and maintenance of pollution prevention infrastructure are trained to an appropriate level to ensure compliance with the Infrastructure Monitoring Programme.

All regular maintenance of all plant and equipment will be completed on the time scale specified by the equipment manufacturer including routine. A full engine overhaul is likely to be scheduled every 20,000 operating hours. This high-level preventative maintenance is designed to avoid unscheduled down time, maximising the plant availability and its ability to control emissions and maintain an efficient level of operation between overhaul services. Record sheets will be completed that would highlight any issues that may require operator intervention outside the routine maintenance programme.

### **Environmental Improvement**

Severn Trent Water is committed to environmental improvements and has established environmental targets and plans relating to materials and waste management, transport, climate change mitigation and adaptation (energy efficiency and renewable energy generation), water resources, biodiversity, river water quality, and drainage asset performance.

The EMS is subject to an annual management review with relevant top management attending with the purpose of evaluating the continued suitability, adequacy and effectiveness of Severn Trent's Environmental Management System, and will include consideration of environmental performance including objectives and targets and opportunities for continual improvement.

### **Competence, Training and Training Records**

Severn Trent Water aims to ensure that all employees are in possession of the knowledge, skills and experience necessary to perform their role in accordance with the company's operating procedures and in full compliance with the law. Training needs are identified by the employee's immediate supervisor or line manager.

The EMS delivers a structured environmental awareness programme and targeted awareness training, where a need is identified. Managers and the CMS (Competence Management System) Manager review the competence of those working for the company where the tasks have the potential to cause a significant negative environmental impact, or impact on the operation of permitted activities within the EMS scope. The IMS (EMS)

Team, Environmental Permits Team and relevant departments are responsible for rolling out the Basic Environmental Awareness Modules and job-specific training.

For each internal training course held a Training Record is issued. The Training Record includes a statement of understanding, which the employee signs to confirm that he/she has attended the course and understood the subject matter.

For each internal training course held a Training Record is issued through the employees' role specific records on SAP.

Induction training is carried out by the responsible line manager and consists of an introduction to the Company's Environmental Health and Safety Policy and description of emergency response and spill prevention procedures.

Staff receive specific training in the plant's operation and the environmental impact of the process as well as health and safety. The operators will have a detailed understanding of the operational procedures for the site for both normal and abnormal conditions. As part of the training, operators will receive specific instructions relating to the environmental aspects and impacts which can have a negative impact on the environment. This training will be provided by the equipment manufacturers or in-house staff as appropriate. All training is overseen by a dedicated in-house Learning and Development team, through "The Academy" process.

Severn Trent Water is able to demonstrate that permitted activities are managed by technically competent staff with its Competence Management System (CMS) that is independently certified to meet the requirements of an Industry Standard. All appointed Technically Competent Persons (TCPs) undergo EMS awareness training and CMS training. TCPs are required to re-take training every 2 years. A list of technically competent persons is stored within the CMS documentation on SharePoint.

### **Managing Contractors**

There are several procedures to ensure contractors have the required skills and environmental competencies to carry out works at the site.

Initially, contractors are assessed by the procurement department for inclusion on the approved supplier list, which includes health and safety and environmental criteria. Even when the contractors are on the approved supplier list, they are still further assessed for each specific contracted activity.

The contractor is required to submit a method statement prior to any commencement of work, identifying how work is to be undertaken and the associated risks. The method statement must be approved by the Site Manager or a TCP who is suitably qualified, who will also identify any site hazards and issue an Authorisation to Work/Enter the site, following a site induction. When on-site, the contractor must carry this Authorisation to Work at all times.

### **Incidents, Non-Compliances and Complaints**

Severn Trent Water has procedures for incidents, non-compliances and environmental complaints.

Incidents are managed through site specific procedures which ensure that all incidents are logged and that necessary preventative and/or corrective actions are taken.

Complaints are managed by Customer Services, where all complaints are logged on the Complaints Records Online Storage System (CROSS). The Regional Managers are responsible for ensuring that action is taken and for liaising with the relevant regulatory bodies (where appropriate). They ensure that any complaint is investigated and, if found to be justified, that work is undertaken to resolve the issue. They also provide an appropriate response to the complainant in a timely manner detailing the reason behind the issue and the actions taken to resolve the matter.

Information regarding complaints is recorded to allow determination of an appropriate response (corrective action) and to determine what measures need to be taken in the future to prevent its reoccurrence (preventive action). These records will be maintained as part of the management system for a minimum of four years.

### **Communication**

There are regular meetings held on site to discuss all aspects of the treatment works and performance against targets. These meetings include the operation and performance of the installation. Other communication methods to promote environmental management issues and continual improvement include: bulletins, newsletters, reports, meetings, intranet articles, One-Supply-Chain forums and compliance audits

### **Auditing**

The controls for addressing environmental aspects and impacts are checked through the EMS audit programme which is managed by the IMS team. Findings are reported to Site Managers and their Leadership Team. The Environmental Permits team audit 4 sites a year as a minimum. These inspections support the EMS audit programme and are audited by the EMS Team on a sample basis. The EMS also checks that other audit programmes exist for our wider environmental obligations, for example, MCerts and Operator Self-Monitoring compliance assessments.

## **4 Environmental risk assessment**

An environmental risk assessment of the site changes has been carried out in line with the requirements of the '*Guidance: Risk assessments for your environmental permit*' published on gov.uk. This guidance specifies the following approach to carrying out an environmental risk assessment for a proposed activity:

- Identify potential risks that your activity may present to the environment;
- Identify possibly receptors, both human and environmental;
- Identify the potential pathway for the risk to reach the receptor;
- Screen out those that are insignificant and don't need detailed assessment;
- Assess potentially significant risks in more detail if needed;
- Choose the right control measures, if needed; and
- Report your assessment.

An environmental screening assessment is provided in Table C2-5. To inform the screening assessment, a review of the sensitivity of the site setting has been undertaken.

The AD installation (the site) comprises the Severn Trent AD facility, LTP and CHP Plant within Severn Trent's Strongford Sewage Treatment Works, which has historically had a permit boundary of the site fenceline. As such, only some aspects of the works are permitted and other areas within the permit boundary are covered by the UWWTD.

Strongford sewage treatment works lies on the south side of the city of Stoke on Trent, just south of the settlement of Trentham and north of the settlement of Barlaston. The site is bordered to the west by the River Trent and then farmland, with more farmland to the south and north of the site. To the east of the site, there is a mixture of open farmland and properties along Barlaston Old Road.

As the permitted area of the site includes the whole of the site within the fence line, the majority of the works, including much of the sludge treatment plant lies within flood zone 1, that is it has a less than 1 in 1000 risk of annual flooding. However, the area where the primary digesters, gas holders, cake pad and gas engines are located are within flood zones 2 and 3, that is areas with an annual risk between 1 in 100 and 1 in 1000; and areas with an annual risk greater than 1 in 100. The wider site boundary encompasses the entire works, and the highest flood risk apply to the north western corner. The site sits outside any source protection zone (SPZ). The

site sits predominately on a secondary A aquifer for drift geology, although eastern parts of the site are on a secondary (undifferentiated) aquifer. The bedrock below the site is a Secondary B aquifer.

A desk study was undertaken to identify any statutory designated sites of ecological or nature conservation importance within 10km of the facility. This was completed using the Multi-Agency Geographic Information for the Countryside (MAGIC) web-based mapping service in January 2026. It found there are two SSSI within 2km of the site, parts of which are also ancient woodland both semi natural and replanted. This block of ancient woodland extends outside the bounds of the SSSI towards the site. There is also a stand of ancient woodland within 2km of the permit boundary on the opposite side of the site. The site does not sit within a nutrient neutral catchment.

The following table lists the nearest habitat sites with their locations and distance from the site. There are no LWS, AW, LNR within 2km of the site. No SAC's SPA's or RAMSAR sites are within 10km of the site.

Site name	Distance from plant (km)	Direction from facility	Citation
King's and Hargreaves Woods (southern area)	0.9km	W	SSSI
King's and Hargreaves Woods (northern area)	2.6km	NW	SSSI
Kings Wood (multiple areas)	0.8km (closest point)	NW	AW
Unnamed ancient woodland (1411625)	0.9km	NE	AW

There are a number of patches of priority habitat (deciduous woodland) within 1km of the site. These include patches along the north east boundary and the south east boundary. There are more extensive areas to the north east across the nearby canal and to the west in the vicinity of Trentham Lake.

The site sits within an AQMA covering the whole of the Stoke on Trent Authority area, designated for NOx.

Table C2-6 Screening Assessment

Consideration	Receptors	Discussion	Detailed Environmental Risk Assessment?
<p>Amenity issues: Litter, vermin and pests</p>	<p>Human health receptors: Single houses or groups of houses (estates, villages etc.). Schools and hospitals. Footpaths, amenity and recreation areas such as playing fields and playgrounds. Industrial estates.</p> <p>There are several residential dwellings located approximately 150m northeast of the site, 150m east, 300m southeast and 450m west of the site. Properties may be at a further distance from sludge assets within the site.</p> <p>There is one international ecological designation within 10km of site. King's and Hargreaves Woods (formerly known as Trentham Park) a SSSI is located 0.9km west of the site. This site is also ancient woodlands, although the woodlands extend closer to the facility</p> <p>There are no national ecological designations or nature reserves within 2km of the site</p>	<p>The wastes handled at the site are primarily liquids and sludges, along with UWWTD derived material delivered by sewer.</p> <p>There is no source of litter within the materials handled at the site.</p> <p>In the unlikely event pests or vermin are observed on site a job is raised with our framework contractor for timely resolution.</p>	<p><b>X</b></p>
<p>Dust and bioaerosols</p>	<p>Human health receptors: Single houses or groups of houses (estates, villages etc.). Schools and hospitals. Footpaths, recreation areas such as playing fields and playgrounds. Industrial estates and rail stations.</p> <p>There are several residential dwellings located approximately 150m northeast of the site, 150m east, 300m southeast and 450m west of the site Properties may be at a further distance from sludge assets within the site.</p> <p>There is one international ecological designation within 10km of site. King's and Hargreaves Woods (formerly known as Trentham Park) a SSSI is located 0.9km west of the site. This site is also ancient woodlands, although the woodlands extend closer to the facility</p> <p>There are no national ecological designations or nature reserves within 2km of the site.</p> <p>The impact of dust on human health will depend on the distance and wind direction.</p>	<p>The wastes handled at the site are liquids, sewage sludges and sewage cake, along with UWWTD derived material delivered by sewer.</p> <p>The site will not be handling inherently dusty or powdery wastes. Sewage cake retains a high moisture content and is not dusty. Roads will be maintained to avoid the production of dust.</p> <p>Produce sewage cake has sufficient moisture content to ensure it does not give rise to dust and is located on the eastern side of the site, away from sensitive receptors.</p> <p>Severn Trent has undertaken bioaerosol monitoring at three sites and found that there are no emissions. A bioaerosol risk assessment has been prepared for the site.</p>	<p><b>X</b></p>

Consideration	Receptors	Discussion	Detailed Environmental Risk Assessment?
<p>Assessment of point source emissions to air</p> <p>Emissions deposited from air to land</p>	<p>Human health receptors: Single houses or groups of houses (estates, villages etc.). Schools and hospitals.</p> <p>Footpaths, recreation areas such as playing fields and playgrounds.</p> <p>Industrial estates and rail stations.</p> <p>There are several residential dwellings located approximately 150m northeast of the site, 150m east, 300m southeast and 450m west of the site. Properties may be at a further distance from sludge assets within the site</p> <p>There is one international ecological designation within 10km of site. King's and Hargreaves Woods (formerly known as Trentham Park) a SSSI is located 0.9km west of the site. This site is also ancient woodlands, although the woodlands extend closer to the facility</p> <p>There are no national ecological designations or nature reserves within 2km of the site.</p> <p>The impact of emissions from air on human health will depend on the distance and wind direction.</p>	<p>The installation has currently permitted biogas fuelled CHP engines, boilers and an auxiliary flare, for which ADMS modelling indicates emissions are unlikely to result in unacceptable impacts on air quality. The temporary boiler on site is sub 1MWth and will be fully assessed when the decision is made on the plant.</p> <p>The gas upgrading plant does not have an impact on air quality.</p> <p>The emergency flares are used only during periods when there is a larger volume of biogas than the CHP engine, gas upgrading plant, or boilers are able to manage or is offline.</p> <p>Fugitive emissions to air are assessed separately.</p>	<p><b>X</b></p>
<p>Assessment of point source and fugitive emissions to water</p>	<p>The River Trent is located less than 100m west of the site.</p> <p>The Trent and Mersey Canal is located approximately 300-400m east of the site but further from sludge assets within the site.</p> <p>There is a small drainage ditch southeast of the site, running along the south perimeter of the main water works.</p> <p>The majority of the works, including much of the sludge treatment plant lies within flood zone 1, that is it has a less than 1 in 1000 risk of annual flooding. However, the area where the primary digesters, gas holders, cake pad and gas engines are located are within flood zones 2 and 3, that is areas with an annual risk between 1 in 100 and 1 in 1000; and areas with an annual risk greater than 1 in 100.</p> <p>Surface water drainage within the site drains to the inlet of the adjacent sewage treatment works for full treatment prior to discharge.</p>	<p>The main product of the process is a sewage cake, which is stored within flood zone 2 and 3, on a concrete pad equipped with drainage.</p> <p>Dewatering liquors are subject to biological aerobic treatment on site prior to release to the works inlet.</p> <p>Other aqueous discharges generated by process are limited (comprising, thickening liquors, biogas condensate, and surface water run off). These sources are discharged to the on-site drainage system where they are transferred to main sewage works inlet.</p> <p>Pending collection of data a full H1 assessment will be carried out on the return liquors.</p> <p>The cellulose recovery plant only returns liquids back into the UWWTD flow at the site which are not chemically or biologically altered.</p>	<p><b>X</b></p>

Consideration	Receptors	Discussion	Detailed Environmental Risk Assessment?
		The ammonia recovery plant has bunded chemical storage associated with it and the outputs will be subject to a full H1 assessment upon commissioning when representative data can be obtained	
Assessment of odour	<p>Human health receptors: Single houses or groups of houses (estates, villages etc.). Schools and hospitals. Footpaths, recreation areas such as playing fields and playgrounds. Industrial estates and rail stations.</p> <p>There are several residential dwellings located approximately 150m northeast of the site, 150m east, 300m southeast and 450m west of the site. Properties may be at a further distance from sludge assets within the site.</p> <p>The impact of emissions from odour on human receptors will depend on the distance and wind direction.</p>	<p>The site has an odour management plan in place. This includes management systems, procedures and monitoring to control fugitive emissions of odour at the plant. Waste inputs to the site are of a similar nature to indigenous waste streams and as such there is no change in odour profile at the site.</p> <p>Odorous activities are centrally located within the site but the location provides screening for this.</p> <p>The cellulose plant has been assessed as not giving rise to odour emissions based upon operational experience in EU plants.</p> <p>The ammonia recovery plant is fully enclosed with products and chemicals stored in fully enclosed tanks. There is no odour source.</p>	X
Energy	Global atmosphere (direct and indirect emissions)	<p>Biogas generated by the facility is subject to upgrading and injection into the gas grid, with excess being utilised to generate electrical power for the site and exported to the grid; thus increasing renewable energy supplies.</p> <p>Waste heat from the CHP engine and THP is utilised to control primary digester temperature when required and reduce demand on the auxiliary boilers.</p> <p>Although the cellulose recovery plant and ammonia stripper require power to operate, the recovery of the associated products has an overall carbon benefit.</p>	X
Land and disposal of waste to other processes	<p>The River Trent is located less than 100m west of the site.</p> <p>The Trent and Mersey Canal is located approximately 300-400m east of the site but further from sludge assets within the site.</p>	<p>All waste streams disposed of off-site will continue to be to appropriately permitted facilities.</p> <p>Cellulose is a solid and stored in enclosed skips</p>	X

Consideration	Receptors	Discussion	Detailed Environmental Risk Assessment?
	<p>There is a small drainage ditch southeast of the site, running along the south perimeter of the main water works.</p> <p>Drainage within the works is diverted to the works inlet.</p> <p>The site is outside any Groundwater source protection zone (SPZ). Aquifers are classified as a Secondary A aquifer for superficial deposits, and Secondary B aquifer for bedrock</p>	<p>Recovered ammonium sulphate is stored in a bunded tank and removed from site by tanker by a suitably permitted company. At present is removed as waste pending the collection of data to support an end of waste submission.</p>	
Noise and vibration	<p>Human health receptors: Single houses or groups of houses (estates, villages etc.). Schools and hospitals. Footpaths, amenity and recreation areas such as playing fields and playgrounds. Industrial estates and rail stations.</p> <p>There are several residential dwellings located approximately 150m northeast of the site, 150m east, 300m southeast and 450m west of the site. Properties may be at a further distance from sludge assets within the site.</p> <p>There is one international ecological designation within 10km of site. King's and Hargreaves Woods (formerly known as Trentham Park) a SSSI is located 0.9km west of the site. This site is also ancient woodlands, although the woodlands extend closer to the facility</p> <p>There are no national ecological designations or nature reserves within 2km of the site.</p>	<p>Site design has been chosen to minimise the impact of noise on offsite receptors through building orientation, finishes and location of openings.</p> <p>Noise from plant and equipment will be minimised through purchasing decisions and a robust preventative maintenance programme. Sensitive receptors are distant to the operational areas of the site, which are screened by the existing structures to reduce noise impacts.</p> <p>There are no sources of vibration within the facility.</p> <p>A noise impact assessment screening exercise has been undertaken which indicates no further assessment is required.</p>	X
Other issues (including visual impact)	Protected Species	<p>There is a protected species, (European Eel), migratory route within 500m of the facility. However, the permitted activities do not discharge directly to surface water.</p> <p>There are no impacts on the protected habitats (deciduous woodland). The section to the north east is away from the emission sources and the section to the south east is not in the prevailing wind direction.</p>	X
Climate Change	Risks of increased temperature impacts resulting in digesters heating beyond optimal operating temperature and increased odour from sewage process.	Digesters may require reduced heat input to digester via heat exchange system and digesters are insulated against worse impacts. Warmer	X

Consideration	Receptors	Discussion	Detailed Environmental Risk Assessment?
	For human health and ecological receptors, see notes for Amenity issues above.	temperatures may require less boiler input/use as a result of less heat demand, or increased heat dumping via air cooled radiator. If less biogas is used, the site may require a new gas engine that is appropriately sized to utilise additional biogas. However, the CHP engines will need to be replaced prior to 2050 when they reach the end of their operational lifespans.	
	Risks of increased storm events that causes surface water runoff exceeds capacity of site drainage system, or additional dewatering operations due to rainwater ingress, or caused bunds to infill. Increased precipitation may increase flooding on agricultural land, decreasing ability to spread digested sludge cake to land. For water environment receptors, see notes for Assessment of point source and fugitive emissions to water above	The STW design may require expansion or additional storm capacity; however, this would apply to UWWTD operations at the site rather than permitted activities.  May need to increase bund or containment volume for sewage treatment works or individual assets.  Land spreading activities could be prevented during very wet, winter months. The site has a cake pad and has access to an offsite pad where sludge cake can be stored prior to application, plans to move digested sludge cake to other sites would remain as at present.	X

## 5 Site condition report

### 5a Are you proposing to make any of the following changes:

Although there is a change in the regulatory listing, there are no new assets involved. The LTP is already on site and the site boundary remains as at present. A copy of the current SCR has been supplied. This has been updated to reflect the additional raw materials in use at the site, although sulphuric acid is not classified as a hazardous substance with regard to assessing risks to the environment.

## 6 Other supporting information

### 6a Provide a non-technical summary of your application

Please see text in introduction section of this document.

### 6b Updated site plans (not for mobile plant)

Please find appended the updated site emission point plan.

### 6c Fire prevention plan (not for mobile plant)

**6c.1 Does our Fire Prevention Plan guidance apply to any of your activities?**

No

**7 Consultation**

**Could the waste operation or installation involve releasing any substance into any of the following?**

**7a A sewer managed by a sewerage undertaker?**

No – site drainage is managed within the wider sewage works, which is entirely within the boundary of this permit, operated by the applicant.

**7b A harbour managed by a harbour authority?**

No

**7c Directly into inshore waters**

No

**7d Is the installation on a site for which:**

*7d1 - a nuclear site licence is needed under section 1 of the Nuclear Installations Act 1965?*

No.

*7d2 - a policy document for preventing major accidents is needed under regulation 5 of the Control of Major Accident Hazards Regulations 1999, or a safety report is needed under regulation 7 of those regulations?*

No.

### 3.2 Form C3

#### 1 What activities are you applying to vary?

Table C3-1a: Types of activities

Line in bold are new or updated activities

Schedule 1 listed activities						
Installation name	Schedule 1 references	Description of the Activity	Activity capacity	Annex I (D codes) and Annex II (R codes) and descriptions	Hazardous waste treatment capacity	Non-hazardous waste treatment capacity
Strongford Sewage Treatment Works	<b>S5.4 A1(b)(i)</b> Recovery or a mix of recovery and disposal of non-hazardous waste with a capacity exceeding 75 tonnes per day (or 100 tonnes per day if the only waste treatment activity is anaerobic digestion) involving biological treatment.	From receipt of permitted waste through to digestion and recovery of by-products (digestate and biogas).	<b>7,003,985 m<sup>3</sup></b> (wet tonnes) per day (input) <b>49,027,895 m<sup>3</sup></b> (wet tonnes) per week (input)	<b>R3: Recycling reclamation of organic substances which are not used as solvents</b> <b>R13 Storage of waste pending any of the operations numbered R1 to R12 (excluding temporary storage, pending collection, on the site where the waste is produced)</b> <b>D15: Storage pending any of the operations numbered D1 to D14 (excluding temporary storage, pending collection, on the site where it is produced)</b>	n/a	<b>7,003,985 m<sup>3</sup></b> per day

Strongford Sewage Treatment Works	S5.4A1(a)(i) Disposal of non-hazardous waste with a capacity exceeding 50 tonnes per day by biological treatment	From receipt of dewatering liquors for aerobic treatment to release of treated liquors to the works inlet	1,360m <sup>3</sup> per day (input) 9,520m <sup>3</sup> per week (input)	D8 Biological treatment not specified elsewhere in this Annex which results in final compounds or mixtures which are discarded by means of any of the operations numbered D1 to D12 D15 Storage pending any of the operations numbered D1 to D14 (excluding temporary storage, pending collection, on the site where the waste is produced)	N / A	1,360m <sup>3</sup> per day
Strongford Sewage Treatment Works	S5.4A1(a)(ii) Disposal of non-hazardous waste with a capacity exceeding 50 tonnes per day by physico-chemical treatment	From receipt of dewatering liquors for ammonia recovery to release of treated liquors to the works inlet	720m <sup>3</sup> per day (input) 5,040m <sup>3</sup> per week (input)	D9 Physico-chemical treatment not specified elsewhere in this Annex which results in final compounds or mixtures which are discarded by means of any of the operations numbered D1 to D12	N / A	720m <sup>3</sup> per day
Waste Activity	Import of waste for aerobic treatment, direct to the head of the works, pending treatment through the UWWTD flow			D9, D13	500,000m <sup>3</sup> per annum	
Waste Activity	Import of waste for aerobic treatment, to holding tanks, prior to release to the head of the works, pending treatment through the UWWTD flow			D9; D13; D15		
Waste Activity	Import of pre-digested / raw cake for treatment through the THP from other WwTWs			R3, R13	15,000m <sup>3</sup> per annum	
Waste Activity	Recovery of cellulose from urban waste water			R3	1460 tonnes per annum (output)	
Waste Activity	From the receipt of digested sludge to dispatch offsite for recovery			R3, R13	20,000m <sup>3</sup> per annum	
Name of DAA		Description of the DAA				
AR2		Storage of waste pending recovery				
AR3		Physical treatment for the purpose of recycling				
AR4		Digestate storage				

AR5	Digestate treatment				
AR6	Treatment and storage of cake				
AR7	Gas treatment and storage				
AR8	Steam and electrical power supply				
AR9	Auxiliary flare operation				
AR10	Raw material storage				
AR11	Surface water collection				
AR12	Gas upgrading				
AR13	Thermal hydrolysis plant operation				
Annual throughput (tonnes each year)	7,003,985 m <sup>3</sup> (wet tonnes)				
Specified Generator Activities					
Activity Reference	National Grid Reference and/or activity reference / emission point	Activity listed in the EP Regulations	Description of MCP and/or specified generator	Fuel	Operating hours limit per anum
AR15	CHP Engine 1	Specified Generator	1x 2.6 MWth CHP engine	Biogas only	Unlimited
	CHP Engine 2	Schedule 25A – ‘New’ Medium Combustion Plant and Specified Generator	1x 2.6 MWth CHP engine	Natural gas and biogas	Unlimited
	CHP Engine 3		1x 2.6 MWth CHP engine	Biogas only	
AR16	Boiler Boiler	Schedule 25B – ‘New’ Medium Combustion Plant	1x 3.0 MWth package boiler 1x 3.0 MWth package boiler with HRSG	Biogas only Natural gas only	Unlimited

Calculation – 6 digesters, 3 x 2900 and 3 x 2540 = 16,320 m<sup>3</sup> capacity.

Assuming 100% capacity and 12 days retention = 1,360m<sup>3</sup> per day = 1,360 wet tonnes per day.

171m<sup>3</sup> imports per day; 1,189m<sup>3</sup> indigenous per day.

Digester feed = 16% tds. Unthickened sludge = 1% tds.

Unthickened sludge = 19,189 m<sup>3</sup> per day = 7,003,985 m<sup>3</sup> per annum

LTP throughput is the daily capacity of the digesters, which is the maximum volume of liquid that could be generated from dewatering.

Throughputs of ammonia stripping plant and cellulose recovery plant are defined by the plant specification and as stated.

## Types of waste accepted

Table C3-1bi – Waste accepted for installation to THP ONLY

<b>19</b>	<b>Wastes from waste management facilities, off-site waste water treatment plants and the preparation of water intended for human consumption and water for industrial use</b>
<b>19 02</b>	<b>wastes from physico/chemical treatment of waste (including dechromatation, decyanidation, neutralisation)</b>
19 02 06	sludges from physico/chemical treatment other than those mentioned in 19 02 05 (sewage sludge only)
<b>19 06</b>	<b>wastes from anaerobic treatment of waste</b>
19 06 06	digestate from anaerobic treatment of animal and vegetable waste (digested sewage sludge only)
<b>19 08</b>	<b>wastes from waste water treatment plants not otherwise specified</b>
19 08 05	sludges from the treatment of urban waste water
<b>20</b>	<b>Municipal wastes (household waste and similar commercial, industrial and institutional wastes) including separately collected fractions</b>
<b>20 03</b>	<b>other municipal wastes</b>
20 03 04	septic tank sludge

Table C3-1bii – Waste accepted for Head of the Works import waste activity ONLY

Waste Code	Description
<b>01</b>	<b>Wastes resulting from exploration, mining, quarrying, and physical and chemical treatment of minerals</b>
<b>01 05</b>	<b>drilling muds and other drilling wastes</b>
01 05 07	freshwater drilling muds and wastes
01 05 07	barite-containing drilling muds and wastes other than those mentioned in 01 05 05 and 01 05 06
01 05 08	chloride-containing drilling muds and wastes other than those mentioned in 01 05 05 and 01 05 06
<b>02</b>	<b>Wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing, food preparation and processing</b>
<b>02 01</b>	<b>wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing</b>
02 01 01	Sludges from washing and cleaning
02 01 02	animal-tissue waste
02 01 03	plant-tissue waste
02 01 06	animal faeces, urine and manure (including spoiled straw), effluent, collected separately and treated off-site
02 01 07	wastes from forestry
02 01 99	residues from commercial mushroom cultivation

<b>02 02</b>	<b>wastes from the preparation and processing of meat, fish and other foods of animal origin</b>
02 02 01	Sludges from washing and cleaning
02 02 02	animal-tissue waste
02 02 03	materials unsuitable for consumption or processing
02 02 04	sludges from on-site effluent treatment
<b>02 03</b>	<b>wastes from fruit, vegetables, cereals, edible oils, cocoa, coffee, tea and tobacco preparation and processing; conserve production; yeast and yeast extract production, molasses preparation and fermentation</b>
02 03 01	Sludges from washing, cleaning, peeling, centrifuging and separation
02 03 02	wastes from preserving agents
02 03 03	wastes from solvent extraction
02 03 04	materials unsuitable for consumption or processing
02 03 05	Sludges from on-site effluent treatment
<b>02 04</b>	<b>wastes from sugar processing</b>
02 04 01	Soil from cleaning and washing beet
02 04 02	off-specification calcium carbonate
02 04 03	Sludges from on-site effluent treatment
<b>02 05</b>	<b>wastes from the dairy products industry</b>
02 05 01	materials unsuitable for consumption or processing
02 05 02	Sludges from on-site effluent treatment
<b>02 06</b>	<b>wastes from the baking and confectionery industry</b>
02 06 01	materials unsuitable for consumption or processing
02 06 02	wastes from preserving agents
02 06 03	Sludges from on-site effluent treatment
<b>02 07</b>	<b>wastes from the production of alcoholic and non-alcoholic beverages (except coffee, tea and cocoa)</b>
02 07 01	wastes from washing, cleaning and mechanical reduction of raw materials
02 07 02	wastes from spirits distillation
02 07 03	wastes from chemical treatment
02 07 04	materials unsuitable for consumption or processing
02 07 05	Sludges from on-site effluent treatment
<b>03</b>	<b>Wastes from wood processing and the production of panels and furniture, pulp, paper and cardboard</b>
<b>03 03</b>	<b>wastes from pulp, paper and cardboard production and processing</b>
03 03 02	green liquor sludge (from recovery of cooking liquor)
03 03 05	de-inking sludges from paper recycling
03 03 07	mechanically separated rejects from pulping of waste paper and cardboard

03 03 08	wastes from sorting of paper and cardboard destined for recycling
03 03 10	fibre rejects, fibre-, filler- and coating-sludges from mechanical separation
03 03 11	Sludges from on-site effluent treatment other than those mentioned in 03 03 10
<b>04</b>	<b>Wastes from the leather, fur and textile industries</b>
<b>04 01</b>	<b>wastes from the leather and fur industry</b>
04 01 01	fleshings and lime split wastes
04 01 05	tanning liquor free of chromium
04 01 07	Sludges, in particular from on-site effluent treatment free of chromium
04 01 09	wastes from dressing and finishing
<b>04 02</b>	<b>wastes from the textile industry</b>
04 02 09	wastes from composite materials (impregnated textile, elastomer, plastomer)
04 02 10	organic matter from natural products (for example grease, wax)
04 02 15	wastes from finishing other than those mentioned in 04 02 14
04 02 17	dyestuffs and pigments other than those mentioned in 04 02 16
04 02 20	Sludges from on-site effluent treatment other than those mentioned in 04 02 19
04 02 22	wastes from processed textile fibres
<b>05</b>	<b>Wastes from petroleum refining, natural gas purification and pyrolytic treatment of coal</b>
<b>05 01</b>	<b>wastes from petroleum refining</b>
05 01 10	sludges from on-site effluent treatment other than those mentioned in 05 01 09
05 01 17	bitumen
<b>05 07</b>	<b>wastes from natural gas purification and transportation</b>
05 07 02	wastes containing sulphur
<b>06</b>	<b>Wastes from inorganic chemical processes</b>
<b>06 03</b>	<b>wastes from the MFSU of salts and their solutions and metallic oxides</b>
06 03 14	solid salts and solutions other than those mentioned in 06 03 11 and 06 03 13
<b>06 05</b>	<b>sludges from on-site effluent treatment</b>
06 05 03	sludges from on-site effluent treatment other than those mentioned in 06 05 02
<b>06 06</b>	<b>wastes from the MFSU of sulphur chemicals, sulphur chemical processes and desulphurisation processes</b>
06 06 03	wastes containing sulphides other than those mentioned in 06 06 02
<b>07</b>	<b>Wastes from organic chemical processes</b>
<b>07 01</b>	<b>wastes from the manufacture, formulation, supply and use (MFSU) of basic organic chemicals</b>
07 01 12	Sludges from on-site effluent treatment other than those mentioned in 07 01 11
<b>07 02</b>	<b>wastes from the MFSU of plastics, synthetic rubber and man-made fibres</b>
07 02 12	Sludges from on-site effluent treatment other than those mentioned in 07 02 11
07 02 15	wastes from additives other than those mentioned in 07 02 14

07 02 17	waste containing silicones other than those mentioned in 07 02 16
<b>07 03</b>	<b>wastes from the MFSU of organic dyes and pigments (except 06 11)</b>
07 03 12	sludges from on-site effluent treatment other than those mentioned in 07 03 11
<b>07 04</b>	<b>wastes from the MFSU of organic plant protection products (except 02 01 08 and 02 01 09), wood preserving agents (except 03 02) and other biocides</b>
07 04 12	sludges from on-site effluent treatment other than those mentioned in 07 04 11
<b>07 05</b>	<b>wastes from the MFSU of pharmaceuticals</b>
07 05 12	sludges from on-site effluent treatment other than those mentioned in 07 05 11
<b>07 06</b>	<b>wastes from the MFSU of fats, grease, soaps, detergents, disinfectants and cosmetics</b>
07 06 12	sludges from on-site effluent treatment other than those mentioned in 07 06 11
<b>07 07</b>	<b>wastes from the MFSU of fine chemicals and chemical products not otherwise specified</b>
07 07 12	sludges from on-site effluent treatment other than those mentioned in 07 07 11
<b>08</b>	<b>Wastes from the manufacture, formulation, supply and use (MFSU) of coatings (paints, varnishes and vitreous enamels), adhesives, sealants and printing inks</b>
<b>08 01</b>	<b>wastes from MFSU and removal of paint and varnish</b>
08 01 12	waste paint and varnish other than those mentioned in 08 01 11
08 01 14	sludges from paint or varnish other than those mentioned in 08 01 13
08 01 16	aqueous sludges containing paint or varnish other than those mentioned in 08 01 15
08 01 18	wastes from paint or varnish removal other than those mentioned in 08 01 17
08 01 20	aqueous suspensions containing paint or varnish other than those mentioned in 08 01 19
<b>08 02</b>	<b>wastes from MFSU of other coatings (including ceramic materials)</b>
08 02 01	waste coating powders
<b>08 03</b>	<b>wastes from MFSU of printing inks</b>
08 03 07	aqueous sludges containing ink
08 03 08	aqueous liquid waste containing ink
08 03 13	waste ink other than those mentioned in 08 03 12
08 03 15	ink sludges other than those mentioned in 08 03 14
<b>08 04</b>	<b>wastes from MFSU of adhesives and sealants (including water proofing products)</b>
08 04 14	aqueous sludges containing adhesives or sealants other than those mentioned in 08 04 13
08 04 16	aqueous liquid waste containing adhesives or sealants other than those mentioned in 08 04 15
<b>10</b>	<b>Wastes from thermal processes</b>
<b>10 01</b>	<b>wastes from power stations and other combustion plants (except 19)</b>
10 01 26	wastes from cooling-water treatment
<b>10 02</b>	<b>wastes from the iron and steel industry</b>
10 02 12	wastes from cooling-water treatment other than those mentioned in 10 02 11
<b>10 08</b>	<b>wastes from other non-ferrous thermal metallurgy</b>

10 08 20	wastes from cooling-water treatment other than those mentioned in 10 08 19
<b>10 10</b>	<b>wastes from casting of non-ferrous pieces</b>
10 10 14	waste binders other than those mentioned in 10 10 13
<b>10 12</b>	<b>wastes from manufacture of ceramic goods, bricks, tiles and construction products</b>
10 12 13	sludge from on-site effluent treatment
<b>11</b>	<b>Wastes from chemical surface treatment and coating of metals and other materials; non-ferrous hydro-metallurgy</b>
<b>11 01</b>	<b>wastes from chemical surface treatment and coating of metals and other materials (for example galvanic processes, zinc coating processes, pickling processes, etching, phosphating, alkaline degreasing, anodising)</b>
11 01 12	aqueous rinsing liquids other than those mentioned in 11 01 11
<b>12</b>	<b>Wastes from shaping and physical and mechanical surface treatment of metals and plastics</b>
<b>12 01</b>	<b>wastes from shaping and physical and mechanical surface treatment of metals and plastics</b>
12 01 17	waste blasting material other than those mentioned in 12 01 16
12 01 21	spent grinding bodies and grinding materials other than those mentioned in 12 01 20
<b>16</b>	<b>Wastes not otherwise specified in the list</b>
<b>16 01</b>	<b>end-of-life vehicles from different means of transport (including off-road machinery) and wastes from dismantling of end-of-life vehicles and vehicle maintenance (except 13, 14, 16 06 and 16 08)</b>
16 01 15	antifreeze fluids other than those mentioned in 16 01 14
<b>16 03</b>	<b>off-specification batches and unused products</b>
16 03 06	organic liquid wastes other than those mentioned in 16 03 05
<b>16 05</b>	<b>gases in pressure containers and discarded chemicals</b>
16 05 05	gases in pressure containers other than those mentioned in 16 05 04
16 05 09	discarded chemicals other than those mentioned in 16 05 06, 16 05 07 or 16 05 08
<b>16 10</b>	<b>aqueous liquid wastes destined for off-site treatment</b>
16 10 02	aqueous liquid wastes other than those mentioned in 16 10 01
16 10 04	aqueous concentrates other than those mentioned in 16 10 03
<b>19</b>	<b>Wastes from waste management facilities, off-site waste water treatment plants and the preparation of water intended for human consumption and water for industrial use</b>
<b>19 01</b>	<b>wastes from incineration or pyrolysis of waste</b>
19 01 18	pyrolysis wastes other than those mentioned in 19 01 17
<b>19 02</b>	<b>wastes from physico/chemical treatments of waste (including dechromatation, decyanidation, neutralisation)</b>
19 02 03	premixed wastes composed only of non-hazardous wastes
19 02 06	sludges from physico/chemical treatment other than those mentioned in 19 02 05
19 02 10	combustible wastes other than those mentioned in 19 02 08 and 19 02 09

<b>19 05</b>	<b>wastes from aerobic treatment of solid wastes</b>
19 05 03	off-specification compost
<b>19 06</b>	<b>wastes from anaerobic treatment of waste</b>
19 06 03	Liquor from anaerobic treatment of municipal waste
19 06 04	Digestate from anaerobic treatment of municipal waste
19 06 05	Liquor from anaerobic treatment of animal and vegetable waste
19 06 06	digestate from anaerobic treatment of animal and vegetable waste
<b>19 07</b>	<b>landfill leachate</b>
19 07 03	landfill leachate other than those mentioned in 19 07 02
<b>19 08</b>	<b>wastes from waste water treatment plants not otherwise specified</b>
19 08 01	screenings
19 08 02	waste from desanding
19 08 05	sludges from treatment of urban waste water
19 08 09	grease and oil mixture from oil/water separation containing only edible oil and fats
19 08 12	Sludges from biological treatment of industrial waste water other than those mentioned in 19 08 11
19 08 14	sludges from other treatment of industrial waste water other than those mentioned in 19 08 13
<b>19 09</b>	<b>wastes from the preparation of water intended for human consumption or water for industrial use</b>
19 09 02	Sludges from water clarification
19 09 03	Sludges from decarbonation
19 09 06	solutions and sludges from regeneration of ion exchangers
<b>19 12</b>	<b>wastes from the mechanical treatment of waste (for example sorting, crushing, compacting, pelletising) not otherwise specified</b>
19 12 12	other wastes (including mixtures of materials) from mechanical treatment of wastes other than those mentioned in 19 12 11
<b>19 13</b>	<b>wastes from soil and groundwater remediation</b>
19 13 04	sludges from soil remediation other than those mentioned in 19 13 03
19 13 06	sludges from groundwater remediation other than those mentioned in 19 13 05
19 13 08	aqueous liquid wastes and aqueous concentrates from groundwater remediation other than those mentioned in 19 13 07
<b>20</b>	<b>Municipal wastes (household waste and similar commercial, industrial and institutional wastes) including separately collected fractions</b>
<b>20 01</b>	<b>separately collected fractions (except 15 01)</b>
20 01 08	biodegradable kitchen and canteen waste
20 01 25	edible oil and fat
20 01 30	detergents other than those mentioned in 20 01 29

<b>20 02</b>	<b>garden and park wastes (including cemetery waste)</b>
20 02 01	biodegradable waste
<b>20 03</b>	<b>other municipal wastes</b>
20 03 01	mixed municipal waste
20 03 02	waste from markets
20 03 03	street-cleaning residues
20 03 04	septic tank sludge
20 03 06	waste from sewage cleaning

Note that these imports may take place direct to the THP plant, or in sealed skips for temporary storage on the cake pad prior to treatment in the THP.

**Table C3-1c – Wastes for dewatering waste activity ONLY**

<b>19</b>	<b>Wastes from waste management facilities, off-site waste water treatment plants and the preparation of water intended for human consumption and water for industrial use</b>
<b>19 08</b>	<b>wastes from waste water treatment plants not otherwise specified</b>
19 08 05	Sludges from treatment of urban waste water

## 2 Point source emissions to air, water and land

Table 2 – Emissions

Installation or Regulated Facility Name		Strongford Sewage Treatment Works				
Point-source emissions to air resulting from proposed change						
Emission point reference and location (NGR/Latitude and Longitude)	Source	Parameter	Limits (inc unit)	Reference Period	Monitoring Frequency	Monitoring Standard or Method
A1 NGR: SJ 87925 39139	CHP engine 1 (biogas only) [Note 1]	NOx	500 mg/m <sup>3</sup>	Average over sample period	Annual	BS EN14792
		SO <sub>2</sub>	162 mg/m <sup>3</sup>			BS EN 14791 Or CEN TS 17021 Or By calculation based on fuel sulphur
		CO	1400 mg/m <sup>3</sup>			BS EN 15058
		Total VOCs	No limit set			--
A2 NGR: SJ 87941 39150	CHP engine 2 (running on natural gas) [Note 1]	NOx	95 mg/m <sup>3</sup>	Average over sample period	Every 3 years	BS EN14792
		CO	No limit set			BS EN 15058
	CHP engine 2 (running on biogas only) [Note 1]	NOx	500 mg/m <sup>3</sup>	Average over sample period	Annual	BS EN14792
		SO <sub>2</sub>	162 mg/m <sup>3</sup>			BS EN 14791 Or CEN TS 17021 Or

						By calculation based on fuel sulphur
		CO	1400 mg/m <sup>3</sup>			BS EN 15058
		Total VOCs	No limit set	--	--	BS 12619
A6 NGR: SJ 87835 39067	Auxiliary flare stack for CHP engines [Note 3]	NOx	150 mg/m <sup>3</sup>	Average over sample period	[Note 3]	BS EN14792
		CO	50 mg/m <sup>3</sup>			BS EN15058
		VOCs	10 mg/m <sup>3</sup>			BS EN12619:2013
A7 NGR: SJ 87993 38935	Biogas upgrading plant stack	No parameter set	No limit set	--	--	--
A8 NGR: SJ 88035 38968	Auxiliary flare for gas to grid plant [Note 3]	NOx	150 mg/m <sup>3</sup>	Average over sample period	[Note 3]	BS EN14792
		CO	50 mg/m <sup>3</sup>			BS EN15058
		VOCs	10 mg/m <sup>3</sup>			BS EN12619:2013
A9a NGR: SJ 88039 39214	CHP engine 3 (running on biogas) [Note 1]	NOx	500 mg/m <sup>3</sup>	Average over sample period	Annual	BS EN14792
		SO <sub>2</sub>	350 mg/m <sup>3</sup>			BS EN 14791 Or CEN TS 17021 Or By calculation based on fuel sulphur
		CO	1400 mg/m <sup>3</sup>			BS EN 15058
		Total VOCs	No limit set	--	--	BS 12619
A9b NGR: SJ 88039 39214	Package boiler 1 (fuelled on biogas) [Note 1]	NOx	200 mg/m <sup>3</sup>	Average over sample period		BS EN14792
		SO <sub>2</sub>	100 mg/m <sup>3</sup>			BS EN 14791 Or CEN TS 17021 Or

						By calculation based on fuel sulphur
		CO	No limit set			BS EN 15058
A9c NGR: SJ 88039 39214	Package boiler 2 with HRSG (fuelled on natural gas) [Note 1]	NOx	100 mg/m <sup>3</sup>	Average over sample period	Every 3 years	BS EN14792
		CO	No limit set			BS EN15058
A10 – A13 NGR: SJ 87859 39079 NGR: SJ 87878 39096 NGR: SJ 87896 39112 NGR: SJ 87915 39129	Digester pressure relief valves	Biogas release and operational events	No limit set	Recorded duration and frequency	Daily inspection	--
A14 - A15 NGR: SJ 87868 39064 NGR: SJ 87891 39081	Gas storage vessels pressure relief valves	Biogas release and operational events	No limit set	Recorded duration and frequency	Daily inspection	--
A16 -A18 NGR: SJ 87896 39017 NGR: SJ 87908 39003 NGR: SJ 87924 38984	Digester pressure relief valves	Biogas release and operational events	No limit set	Recorded duration and frequency	Daily inspection	--
A6 (SO 87110 84162)	Odour control unit (imported sludge well) Channelled emissions from the carbon scrubber and carbon absorption filter. [note 5]	H <sub>2</sub> S	No limit set	Average over sample period	Once every six months	EN ISO 21877
		NH <sub>3</sub>	20 mg/m <sup>3</sup>	Average over sample period	Once every six months	BS EN 13725
		Odour concentration	No limit set	--	Once every six months	CEN TS 13649 for sampling NIOSH 6013 for analysis
		HCl	5 mg/m <sup>3</sup> [note 4]	Average over sample period	Once every six months	EN 1911

	Channelled emissions to air from treatment of water-based liquid waste	TVOC	20 mg/m <sup>3</sup> [note 4]	Average over sample period	Once every six months	EN 12619
A20 NGR: SJ 87922 39059	Odour control unit (buffer tank) Channelled emissions from the biofilter. [note 5]	H <sub>2</sub> S	No limit set	Average over sample period	Once every six months	EN ISO 21877
		NH <sub>3</sub>	20 mg/m <sup>3</sup>	Average over sample period	Once every six months	BS EN 13725
		Odour concentration	No limit set	--	Once every six months	CEN TS 13649 for sampling NIOSH 6013 for analysis
	Channelled emissions to air from treatment of water-based liquid waste	HCl	5 mg/m <sup>3</sup> [note 4]	Average over sample period	Once every six months	EN 1911
		TVOC	20 mg/m <sup>3</sup> [note 4]	Average over sample period	Once every six months	EN 12619
A21 NGR: SJ 87959 38987	Ventilation system (SAS belts)	No parameter set	--	--	--	--
A22 SJ 87992 39213	Odour Control unit (THP) Channelled emissions from the biofilter. [note 5]	H <sub>2</sub> S	No limit set	Average over sample period	Once every six months	EN ISO 21877
		NH <sub>3</sub>	20 mg/m <sup>3</sup>	Average over sample period	Once every six months	BS EN 13725
		Odour concentration	No limit set	--	Once every six months	CEN TS 13649 for sampling NIOSH 6013 for analysis
		HCl	5 mg/m <sup>3</sup> [note 4]	Average over sample period	Once every six months	EN 1911

	Channelled emissions to air from treatment of water-based liquid waste	TVOC	20 mg/m <sup>3</sup> [note 4]	Average over sample period	Once every six months	EN 12619
A23 SJ 87828 39037	Gas storage vessels pressure relief valves	Biogas release and operational events	No limit set	Recorded duration and frequency	Daily inspection	--
A24 NGR: SJ 87935 39069	Ventilation system (Imported Sludge Screenhouse)	No parameter set	--	--	--	--
A25 NGR: SJ 87875 39077	ELOVAC vent	No parameter set	--	--	--	--
A26 NGR: SJ 87883 39068	ELOVAC vent	No parameter set	--	--	--	--
A27 NGR: SJ 88046 39414	Cellulose recovery plant exhaust vent	No parameter set	--	--	--	--
Vents from tanks	Oil/Fuel Storage tanks	No parameter set	No limit set			
<p>Note 1 – These emission limits are based on normal operating conditions and load - temperature 0°C (273 K); pressure 101.3 kPa and oxygen 5% (for gas engines burning biogas) and oxygen 3% (for emergency flares and medium combustion plants other than engines and gas turbines burning biogas such as boilers).</p> <p>Note 2 – This emission limit applies from 1 January 2030, unless otherwise advised by the Environment Agency</p> <p>Note 3 – Monitoring to be undertaken in the event the emergency flare has been operational for more than 10% of the year (876 hours). Record of operating hours to be submitted annually to the Environment Agency</p> <p>Note 4 – Monitoring and limits only apply where the substance concerned is identified as relevant in the waste gas inventory.</p> <p>Note 5 – The monitoring of NH3 and H2S can be used as an alternative to the monitoring of the odour concentration.</p>						

The permitted activities sit within an existing permit boundary of the site fenceline. As such, there are no drainage or liquor returns that cross the permit boundary, the point shown is the approximate location for the returns to cross back into the UWWTD area of the site.

**Table C3-2 Transfer points to wider STW**

Emission point reference and location (NGR/Latitude & Longitude)	Source	Parameter	Concentration	Units
T1 Liquor Returns 1 NGR: SJ 87862 39267	Treated liquors, SAS thickening liquors, dewatering liquors, surface water run off, biogas condensate, boiler blowdown water, contaminated run off, washdown water.	--	--	--
T2 Tanker Imports NGR: SJ 87985 39419	Head of Works imports	--	--	--
T3 Cellulose plant returns NGR: SJ 88032 39399	Cellulose plant returns	--	--	--

**Table C3-3 Sample point(s)**

Sampling point reference and location	Sources
S1 NGR: SJ 87974 39198	Treated liquors from LTP
S2 NGR: SJ 87972 39474	Inlet imports
S3 NGR: SJ 87956 39436	Site returns to Head of Works
S4 NGR: SJ 87815 39191	Digested dewatering centrate return – returns to LTP balance tank in normal operation but may divert to Head of Works
S5 NGR: SJ 87951 38993	SAS Filtrate

There are no permitted emissions to water or land from the activities covered by this permit.

### 3 Operating techniques

#### 3a Technical standards

Table C3-3 Technical standards

Schedule 1 activity or DAA	Best available techniques	Document reference
Anaerobic Digestion plant S5.4A1(b)(i) and other activities	Biological waste treatment: appropriate measures for permitted facilities	Updated 2 <sup>nd</sup> February 2024

#### 3a1 Does your permit have references to any of your own documents or parts of documents submitted as part of a previous application for this site?

Yes – ADMS remains as per previously permitted CHP operations.

#### 3b General requirements

Table C3-4 General requirements

Name of the installation: Strongford STW Bioresources	Document references
If the technical guidance or your risk assessment shows that emissions of substances not controlled by emission limits are an important issue, send us your plan for managing them.	N/A – see Table C2-6 above
If the technical guidance or your risk assessment shows that odours are an important issue, send us your plan for managing them.	See Odour Management Plan Appendix F
If the technical guidance or your risk assessment shows that noise or vibration are important issues, send us your noise or vibration plan (or both).	N/A – see Table C2-6 above

### 3b - General requirements

#### If the TGN or H1 assessment shows that emissions of substances not controlled by emission limits are an important issue, send us your plan for managing them.

Although screened out of the detailed Risk Assessment (Question B2 Q6), due to the nature of the process the installation has the potential to generate fugitive emissions to air and water, which are subject to a number of process controls.

#### Risk Matrix and Terminology for Accident for Risk Assessment

Likelihood ↓	Consequence		
	Low	Medium	High
Low	Low	Low	Medium
Medium	Low	Medium	High
High	Medium	High	High

Classification	Likelihood	Consequence	Risk
<b>Low</b>	Probability of an event is low and likely only to occur in the long-term (a yearly basis or less frequent).	Impact is low or a minor, short-term nuisance. Minor release to a non-sensitive receptor or pollution of water course. Non-permanent health effects to human health (preventable by appropriate PPE). Minor surface damage to buildings; structures; services; or the environment which can be repaired immediately.	A level of harm is possible although this may not be noticeable to a receptor and would be a short-term event without lasting effects. Level of harm can be reduced using industry best practice and appropriate management techniques.
<b>Medium</b>	It is probable that an event will occur periodically in the medium-term (twice yearly basis).	Impact is noticeable in the short to medium-term. Large release impacting on the receiving media killing flora and fauna and requires remediation. Nuisance causing non-permanent health effects to human health. Damage to buildings; structures; services; or the environment preventing short-term use and/or requiring repair.	A level of harm may arise to a receptor which is noticeable although not long-lasting and may require some remedial actions in order to prevent re-occurrences.
<b>High</b>	An event is very likely to occur in the short-term (monthly or weekly basis) and is almost inevitable over the long-term OR there is evidence at the receptor of harm or pollution.	Impact is significant, wide-ranging and long-lasting effect. Has a chronic or acute impact on human health. Very large release that has a major impact on flora and fauna which may be very difficult to remediate. Significant damage to buildings; structures; services; or the environment which prevents use long-term and may require complete replacement. May cause a long-term impact or contribute towards a global issue due to releases of greenhouse gases.	A level of harm is likely to arise to a receptor that is severe causing significant harm to human health or the environment without appropriate remedial and mitigation measures being implemented. Remedial works to infrastructure and processes is required in the long-term.

Although screened out of the detailed Risk Assessment (Question C2 Q6), due to the nature of the processes, the anaerobic digestion operations, aerobic treatment of dewatering liquors and digested sludge cake storage, along with biogas utilisation have the potential to generate fugitive emissions to air and water, which are subject to a number of process controls. Note that risks within this table include those for currently permitted operations.

**Table C3-3b(i) Fugitive emissions risk assessment**

Activity/Hazard	Normal or Abnormal	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
Emissions to air of NO <sub>x</sub> , SO <sub>2</sub> , CO <sub>2</sub> and VOCs	Normal	Emissions to air and dispersion leading to inhalation by local human and animal receptors	High	Low	Medium	Activities are managed and operated in accordance with the site management system (including inspection and maintenance of equipment, including engine management systems), and an LDAR plan. Point source emissions to air (CHP engines, boiler and emergency flare stack) have emission limits for NO <sub>x</sub> , CO <sub>2</sub> , SO <sub>2</sub> .  Flare stack height approx. 6m, CHP stack approx. 6m and boiler flue approx. 15m.	Low
Point source emissions to air of CO and VOCs	Local human population  Harm to human health - Respiratory irritation and illness.	Air transport then inhalation	Low	Medium	Low	Activities are managed and operated in accordance with the site management system (including inspection and maintenance of equipment, including engine management systems), and an LDAR plan. Current point source emissions to air (CHP engines and emergency flare stack) have emission limits for CO and Total VOCs. The biogas upgrade plant CO <sub>2</sub> vent stack is 10m.	Low
Gas transfer systems, gas	Abnormal	Emissions to air and dispersion leading to:	Low	Medium	Low	The plant is designed to capture and utilise all biogas possible, either cleaning up the biogas	Low

<p><b>storage tank, gas engines, flares or PRVs failure causing emissions of biogas</b></p>		<p>inhalation by local human and animal receptors. Odour impact. Global warming potential. Risk of fire and explosion</p>				<p>for injection into the national gas grid, or combusting the biogas for energy recovery purposes, in order to maximise recovered value from the sludge treatment.</p> <p>The gas system utilised is subject to regular preventative maintenance in accordance with an LDAR plan, to minimise the potential for leaks occurring. The system is also protected with a comprehensive array of pressure and flow sensors and with isolation valves to minimise the potential for release if a leak is detected.</p> <p>Vents on ELOVAC are only operated in emergency situation.</p> <p>Personnel on site wear portable gas detectors in order to alert staff to presence of biogas.</p> <p>Two waste gas burners (flares) are utilised for the safe disposal of surplus gas in the event of plant breakdown, or a surplus of gas above the level that can be safely stored or utilised. Use of waste gas burners (flares) is recorded.</p> <p>When the biogas upgrade plant is operating, there may be minor vents of gas during start-up operations. In the event that the grid connection is not available, biogas will be burnt in the CHP engines or THP boilers on site, with any excess being flared.</p>	
<p><b>Catastrophic loss of biogas</b></p>	<p>Abnormal</p>	<p>Emissions to air and dispersion leading to:</p>	<p>Low</p>	<p>High</p>	<p>Medium</p>	<p>The plant is designed to capture and utilise all biogas possible, either cleaning up the biogas</p>	<p>Medium</p>

<p><b>emissions from gas transfer systems, gas storage tank, gas engines, flares or PRVs</b></p>		<p>inhalation by local human and animal receptors. Odour impact. Global warming potential. Risk of significant fire and explosion</p>				<p>for injection into the national gas grid, or combusting the biogas for energy recovery purposes, in order to maximise recovered value from the sludge treatment.</p> <p>The gas system utilised is subject to regular preventative maintenance including an LDAR plan, to minimise the potential for leaks occurring. The system is also protected with a comprehensive array of pressure and flow sensors and with isolation valves to minimise the potential for release if a leak is detected.</p> <p>Two waste gas burners (flares) are utilised for the safe disposal of surplus gas in the event of plant breakdown, or a surplus of gas above the level that can be safely stored or utilised. Use of waste gas burners (flares) is recorded.</p> <p>When the biogas upgrade plant is operating, there may be minor vents of gas during start-up operations. In the event that the grid connection is not available, biogas will be burnt in the CHP engines or THP boilers on site, with any excess being flared.</p> <p>PRVs are place on the top of the digesters and gas holder to be operated in the event of failure of the emergency flare to prevent overpressurisation and catastrophic failure.</p>	
<p><b>Combustion of biogas within CHP engines and emergency flares.</b></p>	<p>Normal</p>	<p>Emissions to air and dispersion leading to: inhalation by local human</p>	<p>High</p>	<p>Low</p>	<p>Medium</p>	<p>Combustion plant is regularly maintained and appropriately sized to manage volumes of gas.</p>	<p>Low</p>

<p><b>Combustion of biogas or natural gas within boilers</b></p>		<p>and animal receptors. Global warming potential</p>				<p>Combustion plant operates within permitted ELVs subject to routine monitoring against permit compliance.</p> <p>CHP engine located away from the nearest residential and commercial properties which are over 300m away to the east. The nearest receptor to the emergency flare is approx 120m to the east.</p>	
<p><b>Release of bioaerosols and dust</b></p>	<p>Normal</p>	<p>Emissions to air and dispersion leading to inhalation by local human and animal receptors. Odour impact of bioaerosols. Nuisance impact of dust.</p>	<p>High</p>	<p>Low</p>	<p>Medium</p>	<p>The risk of bioaerosol and dust is largely minimised by storing the digested sludge cake on the north eastern side of the site on a cake pad, away from nearby receptors.</p> <p>The cake pad is approximately 350m from the nearest sensitive receptors, located to the west of the cake pad. Cake is stored on an engineered hardstanding cake pad which is connected to the site drainage system.</p> <p>Roads are made from concrete/asphalt and not prone to the generation of dust.</p> <p>No dust or bioaerosols are produced or emitted from the cellulose recovery plant or the ammonia plant.</p>	<p>Low</p>
<p><b>Release of bioaerosols and dust from spillages</b></p>	<p>Abnormal</p>	<p>Emissions to air and dispersion leading to inhalation by local human and animal receptors with potential harm to health. Odour impact of</p>	<p>Medium</p>	<p>Low</p>	<p>Low</p>	<p>The risk of bioaerosol and dust is largely minimised by storing the digested sludge cake on the north eastern side of the site on a cake pad. This is approximately 350m from the nearest sensitive receptors. Cake is stored on</p>	<p>Low</p>

		bioaerosols. Nuisance impact of dust.				<p>an engineered hardstanding cake pad which is connected to the site drainage system.</p> <p>Roads are made from concrete/asphalt and not prone to the generation of dust.</p> <p>Staff responsible for site housekeeping and cleaning of spillages in a timely manner.</p>	
<b>Spillage of liquids, including chemicals and oils.</b>	Abnormal	<p>Emissions to surface waters close to and downstream of site. Acute effect resulting in loss of flora and fauna. Chronic effect resulting in deterioration of water quality</p> <p>Emissions to ground and ground water.</p>	Low	Medium	Low	<p>The closes surface water body is the River Trent between approximately 25m and 50m west of the site boundary.</p> <p>Chemicals and oils all stored within suitably bunded tanks and IBCs with rainwater removed as required to maintain 110% capacities. Chemical delivery areas are centrally located and fitted with penstock valves to contain large spillages.</p> <p>The ammonia recovery plant has separate bunded tanks for process chemicals and the output chemicals. The acid tank is plastic and areas close to it are coated with acid resistant paint to reduce the risk to the concrete from any leaks or drips.</p> <p>Handling and use of chemicals and oils is carried out by trained personnel. COSHH data sheets available.</p> <p>Spill kits available on site.</p>	Low

						There are no point source emissions to water with drainage system pumping back to works inlet.	
<b>Spillage from storage and digestion tanks, overtopping of tanks, leakage from same tanks and from buried pipes</b>	Abnormal	<p>Emissions to surface waters close to and downstream of site. Acute effect resulting in loss of flora and fauna. Chronic effect resulting in deterioration of water quality</p> <p>Emissions to ground and ground water.</p>	Medium	Medium	Medium	<p>The site lies outside any Groundwater Source Protection Zone (SPZ).</p> <p>Provision of suitably structurally integral tanks constructed from concrete, steel and glass reinforced plastic/insulation (where needed). All tanks are subject to internal and external asset inspection and proactive maintenance programme including regular visual inspection for cracks or weeping.</p> <p>Leak detection systems, visual checks during regular day-to-day operations and scheduled preventative maintenance of equipment, such as pumps, pipes, joins etc</p> <p>Biogas condensate discharged back to the works inlet through site drainage system.</p> <p>Spill kits available on site.</p> <p>There are no point source emissions to water with drainage system pumping back to works inlet.</p>	Low
<b>Generation of solid waste resulting in litter</b>	Normal	Releases of litter to the environment. Visual nuisance and local loss of amenity	Low	Low	Low	Site operations do not give rise to large amounts of solid wastes and litter that would be prone to dispersion by wind. Rags are stored within skips and retain high moisture content.	Low

						<p>The output from the cellulose plant is stored in covered skips prior to collection from the site.</p> <p>Waste is stored securely for collection by appropriately licensed approved contractors.</p> <p>Litter picking activities are completed as required.</p>	
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Where the TGN or H1 assessment shows that odours are an important issue, send us your odour management plan.

Due to the nature of the process, the installation has the potential to generate odorous emissions resulting from the permitted activities. Odour management is a key operational objective, as summarised in the risk assessment table below. A copy of the site-specific odour management plan has been appended to this application as Appendix F.

**Table C3-3b(ii) Odour risk assessment**

Activity/Hazard	Normal or Abnormal	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
<b>H<sub>2</sub>S/biogas emissions from uncovered tanks</b>	Normal	<p>Emissions to air and dispersion leading to inhalation by local human receptors</p> <p>Loss of amenity from odour nuisance</p>	High	Low	Medium	<p>Biogas will principally be generated in the four primary digestion tanks which are covered with fixed roofs. The use of the elphyra and elovac systems will minimise the fugitive emissions of biogas within the process.</p> <p>The nearest properties is over 250m south east from the digesters. The nearest residential properties are over 400m to the north east.</p> <p>Small amounts of biogas may also be generated within reception tanks and digestate storage tanks located centrally.</p>	Low

						H <sub>2</sub> S production is controlled through the digestion process which can be manually overridden if required.	
<b>Release from vents and exhausts on THP</b>	Abnormal	Local human population. Loss of amenity from odour nuisance	Medium	Low	Medium	Venting of process gasses, including steam are minimised through the plant design. Only UWWTD derived materials treated through the THP process, with the pasteurisation process producing fewer emissions	Low
<b>Loss of containment from biogas holder and biogas pipework</b>	Abnormal	Emissions to air and dispersion leading to inhalation by local human receptors  Loss of amenity from odour nuisance	Low	Medium	Low	<p>Biogas is principally stored within a biogas holder which is suitably sized to manage biogas generation.</p> <p>The gas system (upgrading plant and engines) utilised is subject to regular preventative maintenance to minimise the potential for leaks occurring. The system is also protected with a comprehensive array of pressure and flow sensors and with isolation valves to minimise the potential for release if a leak is detected.</p> <p>Personnel on site wear portable gas detectors in order to alert staff to presence of biogas.</p> <p>Physical protection measures in place for biogas holder, including kerbing and bollards and pipework is guarded.</p> <p>PRVs available to safely manage pressures within the biogas holder and prevent under or over pressurization.</p>	Low

<p><b>Activation of biogas pressure relief valve</b></p>	<p>Abnormal</p>	<p>Emissions to air and dispersion leading to inhalation by local human receptors</p> <p>Loss of amenity from odour nuisance</p>	<p>Low</p>	<p>Low</p>	<p>Low</p>	<p>PRVs are only activated in emergency situations to maintain safety within the biogas system and are re-seated/repairs promptly to minimize biogas emissions.</p> <p>PRVs subject to monitoring via pressure on SCADA and visual checks by site personnel.</p> <p>Biogas is principally stored within the site gas holders which are suitably sized to manage biogas generation and act as buffer storage for biogas. The site can export biomethane to the national gas grid as well as utilise it within gas engines and boilers within the site.</p> <p>The biogas upgrading plant, CHP engines and boilers are subject to regular maintenance to maintain maximum use of outlets, with flare maintained in good working order should it need to be used.</p> <p>The nearest properties, an industrial site, is over 250m south east from the digesters. The nearest residential properties are over 400m to the north east.</p>	<p>Low</p>
<p><b>H<sub>2</sub>S/biogas emitted when biogas cannot be utilised by upgrading plant, engines, boilers or flare</b></p>	<p>Abnormal</p>	<p>Emissions to air and dispersion leading to inhalation by local human receptors</p> <p>Loss of amenity from odour nuisance</p>	<p>Low</p>	<p>Low</p>	<p>Low</p>	<p>H<sub>2</sub>S production is controlled through the digestion process.</p> <p>Biogas is principally stored within the site gas holders which are suitably sized to manage biogas generation and act as buffer storage for biogas. The site can export biomethane to the</p>	<p>Low</p>

						<p>national gas grid as well as utilise it within gas engines and boilers within the site.</p> <p>The nearest properties is over 250m south east from the digesters. The nearest residential properties are over 400m to the north east.</p> <p>The biogas upgrading plant, CHP engines and boilers are subject to regular maintenance to maintain maximum use of outlets, with flare maintained in good working order should it need to be used.</p>	
<b>Storage of treated digested sludge cake (imported and indigenous)</b>	Normal	<p>Emissions to air and dispersion leading to inhalation by local human receptors</p> <p>Loss of amenity from odour nuisance</p>	High	Low	Medium	<p>Digested sludge cake is stored on an engineered hardstanding cake pad which is connected to the site drainage system on the west of the site and is inherently low odour material. Nearest receptors are approx. 375m west of the pad.</p> <p>In the event raw cake is stored temporarily on the pad, it is stored seperately to digested cake and is stored for the minimum period practicable before transfer to the THP plant.</p> <p>Should any odorous sludge cake be produced, this will be subject to process checks undertaken to identify root cause of production and removed from site expediently.</p>	Low
<b>Failure of odour control units</b>	Abnormal	Emissions to air and dispersion leading to inhalation by local human receptors	Low	High	Medium	Odour control units are subject to regular preventative maintenance.	Low

		Loss of amenity from odour nuisance				Media is replaced inline with the manufacturer recommendations	
<b>Storage of site generated wastes</b>	Normal	Emissions to air and dispersion leading to inhalation by local human receptors  Loss of amenity from odour nuisance	Low	Low	Low	General wastes generated on site are not inherently odorous and is stored securely for collection by appropriately licensed approved contractors.  The cellulose plant outputs have been cleaned prior to storage in a covered skip and removed from site on a frequent basis.  The outputs from the ammonia recovery plant are stored in an enclosed tank as a liquid and removed from site by tanker on a weekly basis.	Low

If the TGN or H1 assessment shows that noise or vibration are important issues, send us your noise or vibration management plan (or both)

The installation has the potential to generate noise as a result of the permitted activities. Potentially noisy activities are subject to a number of process controls and noise management is a key operational objective, as summarised in the risk assessment table below. A noise screening assessment has been undertaken and the output presented later

**Table C3-3b(iii)Noise risk assessment**

Activity/Hazard	Normal or Abnormal	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
<b>Operation of CHP engine</b>	Normal	Generation of noise with air transportation, causing loss of amenity to local human receptors	High	Low	Medium	The CHP engines are acoustically baffled, self-contained and designed for external applications therefore noise emissions are already low.	Low

						<p>CHP engines are located over 250m from the nearest sensitive receptor, located to the south east. Good maintenance of plant to ensure that excessive noise levels are not generated.</p> <p>Regular checks of noise mitigation measures fitted to items of plant. Such measures include silencers and baffles fitted to specific areas of plant. Where repair or replacement is required, the plant will, where possible, be taken out of service until repair or replacement of parts has been undertaken.</p>	
<b>Operation of fans on air cooled radiators</b>	Normal	Generation of noise with air transportation, causing loss of amenity to local human receptors	High	Low	Medium	<p>Air cooled radiators do not give rise to high levels of noise and are only used as required. They are centrally located, away from sensitive human receptors with the nearest sensitive receptors over 250m away.</p> <p>Good maintenance of fans to ensure that excessive noise levels are not generated. Where repair or replacement is required, this will be completed promptly.</p>	Low
<b>Biogas fans, biogas upgrade plant</b>	Normal	Local human population Loss of amenity, nuisance impact	Low	Low	Low	<p>Fans of a low noise specification and subject to regular checks and maintenance. Plant located such that surrounding structures shield receptors from the noise source.</p> <p>The gas upgrade plant was designed with minimal mechanical components and is contained within a sealed unit.</p>	Low

<b>Operation of site vehicles</b>	Normal	Generation of noise with air transportation, causing loss of amenity to local human receptors.  Generation of vibration with ground transmission, causing loss of amenity to local human receptors.	Medium	Medium	Medium	Vehicle movements across the site subject to speed limit and traffic management plan to reduce generation of noise.  Reversing obligations minimised by site layout.  Tanker deliveries limited to daytime only.	Low
<b>Operation of emergency flare</b>	Abnormal	Generation of noise with air transportation, causing loss of amenity to local human receptors.	Medium	Low	Medium	Use of the emergency flares is minimized by prioritizing use of the biogas upgrade plant, CHP and boilers with use of the flare recorded.  The nearest sensitive receptors are over 100m away to the south east and the nearest residential receptors are over 325m away to the east. Use of the flare is recorded.	Low

**Table C3-3b (iv) - Environmental Risk Assessment and Accident Management Plan**

Activity/Hazard	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
<b>Major fire and/or explosion causing the release of polluting materials to air, water or land.</b>	Emissions to air and dispersion leading to inhalation by local human receptors. Respiratory irritation, illness and nuisance to local population  Emissions to ground and ground water of digestate contaminating soil and/or	Low	High	Medium	Follow site Incident Response Plan and inform relevant authorities.  Management systems requires DSEAR assessment which is adhered to by site operations.	Low

	<p>groundwater. Run-off from site polluting surface water courses. Harm to aquatic flora and fauna and chronic effect on water quality.</p> <p>Injury to staff, fire fighters or arsonists/vandals.</p>				<p>Designated ATEX zones on site and lightning protection system in place around biogas holder. Fire alarm system installed and maintained.</p> <p>Biogas contained within a closed system and monitored for safety. Automatic cut off valve to biogas supply to stop gas flows, electric temperature sensor, pressure monitors, flame arrestors, etc. Upgrading plant has automatic cut off valve on export line.</p> <p>Warning signs clearly displayed and staff wear gas alarms to alert to the presence of biogas. All visitors subject to site inductions and accompanied. Permit-to-work system in place.</p> <p>Preventative maintenance programme and maintenance plans are in place in order to maintain equipment effectively.</p> <p>Smoking only permitted in designated areas of site.</p>	
<p><b>Minor fire causing the release of polluting materials to air, water or land</b></p>	<p>Emissions to air and dispersion leading to inhalation by local human receptors. Respiratory irritation, illness and nuisance to local population</p> <p>Emissions to ground and ground water of digestate contaminating soil and/or groundwater. Run-off from site polluting surface water courses. Harm to aquatic flora and fauna</p>	<p>Low</p>	<p>Medium</p>	<p>Low</p>	<p>Follow site Incident Response Plan and inform relevant authorities.</p> <p>Management systems requires DSEAR assessment which is adhered to by site operations.</p> <p>Designated ATEX zones on site and lightning protection system in place around biogas holder. Fire alarm systems installed and maintained.</p> <p>Biogas contained within a closed system and monitored for safety. Automatic cut off valve to</p>	<p>Low</p>

	<p>and chronic effect on water quality.</p> <p>Injury to staff, fire fighters or arsonists/vandals.</p>				<p>biogas supply to stop gas flows, electric temperature sensor, pressure monitors, flame arrestors, etc.</p> <p>Warning signs clearly displayed and staff wear gas alarms to alert to the presence of biogas. All visitors subject to site inductions and accompanied. Permit-to-work system in place.</p> <p>Preventative maintenance programme and maintenance plans are in place in order to maintain equipment effectively.</p> <p>Smoking only permitted in designated areas of site.</p>	
<b>Failure to contain firefighting water</b>	<p>Emissions to ground and ground water of contaminated firefighting water entering soil and/or groundwater. Run-off from site to surface water courses.</p> <p>Harm to aquatic flora and fauna.</p> <p>Chronic effect on water quality</p>	Low	Medium	Low	<p>Likelihood of firefighting water being generated is low as the risk of fire is low.</p> <p>Follow site Incident Response Plan and inform relevant authorities.</p> <p>Spill kits provided around the site can be used to direct run-off towards site drainage. Site drainage returns to works inlet providing containment and treatment process for fire water.</p> <p>Arrange for off-site tankering of firefighting water, if required.</p>	Low
<b>Accidental explosion of biogas</b>	<p>Emissions to air and dispersion leading to inhalation by local human receptors. Respiratory irritation, illness and nuisance to local population.</p>	Low	High	Medium	<p>Follow site Incident Response Plan and inform relevant authorities.</p> <p>Management systems requires DSEAR assessment which is adhered to by site operations.</p>	Low

	<p>Injury to staff, fire fighters or arsonists/vandals.</p> <p>Pollution of water or land</p>				<p>Designated ATEX zones on site and lightning protection system in place around biogas holder. Fire alarm systems installed and maintained.</p> <p>Biogas contained within a closed system and monitored for safety. Automatic cut off valve to biogas supply to stop gas flows, electric temperature sensor, pressure monitors, flame arrestors, etc. Lightning protection system installed</p> <p>Likelihood reduced by availability of multiple on site uses of biogas (Upgrading plant, CHP, boilers and emergency flare) and use of pressure release valves as a safety measure.</p>	
<p><b>Significant leak of biogas to atmosphere</b></p>	<p>Emissions to air and dispersion leading to inhalation by local human receptors. Respiratory irritation, illness and nuisance to local population.</p> <p>Global warming potential of greenhouse gases.</p>	Low	High	Medium	<p>Site assets are protected by physical means to prevent vehicle strike and exposed pipework is guarded.</p> <p>Regular proactive and preventative maintenance and regular visual checks.</p> <p>Pressure relief valves are present to avoid overpressurisation of biogas system.</p>	Low
<p><b>Leaks of emission to air, but principally NOx.</b></p>	<p>Emissions to air and dispersion leading to harm to protected nature conservation sites – LNRs. Aws, SSSIs, SAC and SPA.</p> <p>Harm to protected site through toxic contamination, nutrient enrichment, disturbance etc.</p>	Medium	Medium	Medium	<p>The site is within an AQMA.</p> <p>The nearest designated protected habitat are 2x SSSI and multiple AWs, within 2km of the site. The nearest site is a SSSI which is approx. 0.9 km away. There are no LWS, AW, LNR within 2km of the site. No SAC's SPA's or RAMSAR sites are within 10km of the site.</p>	Low

					<p>Emissions modelling shows that deposition and impacts on habitats sites are acceptable.</p> <p>Site operations will be subject to emission limits under current Regulations with infrastructure designed to minimise uncontrolled releases. Checks, monitoring and preventative maintenance will further minimise fugitive emissions.</p>	
<p><b>Spillage of raw materials during (e.g. diesel, polymer) during use, transfer and disposal operations.</b></p>	<p>Emissions to ground and ground water of materials entering soil and/or groundwater. Run-off of liquids from site to surface water courses.</p> <p>Harm to aquatic flora and fauna.</p> <p>Chronic effect on water quality</p>	<p>Low</p>	<p>Medium</p>	<p>Low</p>	<p>Raw materials are stored on made ground, within bunded containers or on bunds to contain spillages of 110% of the volume. Contents of bunds are regularly checked during environmental audits and after periods of heavy rainfall and emptied as required.</p> <p>Liquid outputs from the ammonia recovery plant are stored in a bunded tank on site.</p> <p>In event of a spillage, follow site spillage response plan and inform relevant site personnel. COSHH data sheets available.</p> <p>Deliveries to site are made by approved suppliers. Use of raw materials is carried out by trained personnel or automatically controlled processes.</p> <p>Penstock valves available within chemical delivery areas to contain large spillages. In the event of a minor spillage, spill kits are provided around the site which can be used to contain a spillage and direct it towards site drainage if suitable. Areas for the storage of strong acid have been coated with acid resistant paint to minimise the risk of damage to the concrete surfacing.</p>	<p>Low</p>

					Site drainage returns to works inlet providing treatment process for suitable materials, or arrange off-site tankering of waste, if required.	
<b>Spillage of sludges (e.g. raw sludge, digested sludge) during processing and transfer operations e.g. tank overtopping, pipework leaks</b>	<p>Emissions to ground and ground water of materials entering soil and/or groundwater. Run-off of liquids from site to surface water courses.</p> <p>Harm to aquatic flora and fauna.</p> <p>Chronic effect on water quality</p>	Low	Low	Low	<p>Processing and transfer operations of waste materials is largely an automatic process controlled by the Process Controllers and parameters set within the SCADA system.</p> <p>Storage and digestion tanks are fitted with sensors to monitor levels within a tank and can inhibit additional pumping if high alarms activate.</p> <p>Preventative maintenance programme and maintenance plans are in place in order to maintain equipment effectively and minimise the risk of spillages.</p> <p>In event of a spillage, follow site spillage response plan and inform relevant site personnel and relevant authorities.</p> <p>Spill kits are provided around the site which can be used to contain a spillage and direct it towards site drainage. Site drainage returns to works inlet providing treatment process for sludge or arrange off-site tankering of waste to another site. Sludge is relatively viscous and not highly mobile.</p>	Low
<b>Failure of sludge storage tanks / digester tanks</b>	<p>Emissions to ground and ground water of materials entering soil and/or groundwater. Run-off of liquids from site to surface water courses.</p>	Low	High	Medium	<p>Follow site Incident Response Plan and inform relevant authorities.</p> <p>Regular infrastructure inspections for tanks and pipework and planned preventive maintenance</p>	Low

	<p>Harm to aquatic flora and fauna.</p> <p>Chronic effect on water quality.</p>				<p>system in place. Regular visual inspections for tanks and pipework and reactive maintenance.</p> <p>In-line flow monitoring in key locations and tank level monitoring would identify losses and enable a quick response.</p> <p>Tanks are found on unmade ground but are connected to site drainage which returns to works inlet. Sludge is relatively viscous and not highly mobile limiting the distance it can spread in a short time period.</p>	
<p><b>All on-site hazards: machinery</b></p>	<p>Direct physical contact with human population and /or livestock after gaining unauthorised access to the installation</p> <p>Bodily injury</p>	Low	High	Medium	<p>Direct physical contact is minimised by activity being carried out by enclosed plant and equipment, which has undergone a HAZOP assessment</p> <p>Site activities are managed and operated in accordance with a management system. Site physical security measures to prevent unauthorised access.</p> <p>Assets are protected by various physical means including fencing, kerbing and bollards to prevent vehicle strikes.</p> <p>Site has a one-way traffic management system to minimise the need to reverse. Use of banksmen as appropriate.</p> <p>Vehicles equipped with reversing alarms.</p>	Low
<p><b>Vandalism causing the release of polluting materials to air (smoke)</b></p>	<p>Emissions to air and dispersion leading to inhalation by local human receptors. Respiratory</p>	Low	High	Medium	<p>Unauthorised access is unlikely to happen and minimised by physical site security measures and effective management systems.</p>	Low

<p><b>or fumes), water or land.</b></p>	<p>irritation, illness and nuisance to local population</p> <p>Emissions to ground and ground water of digestate contaminating soil and/or groundwater. Run-off from site polluting surface water courses. Harm to aquatic flora and fauna and chronic effect on water quality.</p> <p>Injury to staff, fire fighters or arsonists/vandals.</p>				<p>Site has access controlled gated entry for all vehicular access. Fence runs the perimeter of the site.</p> <p>Additional security fences around some assets and other assets are kept within locked containers or buildings. Warning signs are displayed.</p>	
<p><b>Flooding from rivers, streams and groundwater</b></p>	<p>Emissions to surface water course and harm to aquatic flora and fauna. Infiltration to ground and groundwater. Harm to aquatic flora and fauna and chronic effect on water quality.</p>	<p>Medium</p>	<p>Low</p>	<p>Low</p>	<p>The site generally sits within Flood Zone 1 and has a low annual probability of flooding, however areas around the primary digesters and the cake pad are in flood zones 2 and 3.</p> <p>General wider works designed to minimise risk of localised works flooding due to storm surges.</p> <p>Follow site Incident Response Plan and inform relevant authorities.</p> <p>Take appropriate corrective and preventative actions to minimise environmental impact</p>	<p>Low</p>
<p><b>Flooding due to drain blockages and/or excessive rainfall causing localised on-</b></p>	<p>Emissions to surface water course and harm to aquatic flora and fauna. Infiltration to ground and groundwater. Harm to</p>	<p>Medium</p>	<p>Low</p>	<p>Low</p>	<p>Site wide drainage system linked to main sewage works, which includes additional capacity in storm tanks within the works to manage additional flows.</p>	<p>Low</p>

<p><b>site surface water flooding</b></p>	<p>aquatic flora and fauna and chronic effect on water quality.</p>				<p>Follow site Incident Response Plan and inform relevant authorities.</p> <p>Take appropriate corrective and preventative actions to minimise environmental impact</p>	
<p><b>Loss of mains power leading to failure of pumps / control systems and possible leaks and escape of sludge.</b></p>	<p>Emissions to ground and ground water of materials entering soil and/or groundwater. Run-off of liquids from site to surface water courses. Harm to aquatic flora and fauna.</p>	<p>Low</p>	<p>Medium</p>	<p>Low</p>	<p>Site CHP engines are able to supply electricity to the site using biogas supplies on site. Standby generators provide back-up power / contingency plans to provide power to critical operations in the event of an electrical outage.</p> <p>Failsafe systems in place to ensure sludge remains in situ in the event of a loss of power and that systems are promptly returned into operation.</p> <p>Site wide drainage system linked to main sewage works in the event of a spillage.</p>	<p>Low</p>

**3c – Types and amounts of raw materials**

**Table C3-5 Types and amounts of raw materials**

Strongford Sewage Treatment Works					
Name of the installation					
Schedule 1 activity	Description of raw material and composition	Maximum storage amount (tonnes or as stated)	Annual throughput (tonnes per annum or as stated)	Description of the use of the raw material including any main hazards (include safety data sheets)	Alternatives
S5.4 A(1) (b) (i)	Antifoam Product name: KemFoamX 2599 Burst 5400	11,000 litres stored in bundled 1,000 litre IBCs	<200,000 litres	Added to primary digesters to reduce foaming. Polluting to watercourses in the event of spillage/loss	Standard product used within industry. No viable alternative
S5.4 A(1) (b) (i)	Polymer (dry, powder) Product name: Flopam FO 4490	6,750kg (9x 750kg powder bags – to be mixed with water) - 25 tonne polymer silo	<100,00 litres	Coagulant in sludge thickening process. Polluting to watercourses in the event of spillage/loss	Standard product used within industry. No viable alternative
S5.4 A(1) (b) (i)	Polymer (liquid) Product name: Flopam EM640	4,000 litres stored in bundled 1,000 litre IBCs	<20,000 litres	Coagulant in sludge thickening process. Polluting to watercourses in the event of spillage/loss	Standard product used within industry. No viable alternative
S5.4 A(1) (b) (i)	Water treatment chemical Product name: Hydrex	600 litres	<800 litres	Used in waste water treatment system to prevent scale deposition, corrosion, fouling and biological problems	Standard product used within industry.
S5.4 A(1) (a) (i) – LTP	Caustic soda	5 tonnes	20 tonnes	Used in the Amtreat (LTP) process. Corrosive	Standard product used within industry.
S5.4 A(1) (b) (i)	Lubricating oil	Total 14,200 litres (2x 4,600 litre tanks and 1x 5,000 litre tank)	<15,000 litres	Equipment lubricant Polluting to watercourses in the event of spillage/loss	Standard product used within industry.

Name of the installation	Strongford Sewage Treatment Works				
Schedule 1 activity	Description of raw material and composition	Maximum storage amount (tonnes or as stated)	Annual throughput (tonnes per annum or as stated)	Description of the use of the raw material including any main hazards (include safety data sheets)	Alternatives
		Delivered in metal drums and stored on bunded pallet trays			
S5.4 A(1) (b) (i)	Fuel oil	7,500 litres	As required	Standby fuel for boiler plant	Standard product used within industry.
S5.4 A(1) (b) (i)	Glycol (antifreeze) in cooling circuit	Not stored on site	As required		
S5.4 A(1) (b) (i)	Waste oil	9,600 litres (1x 4,600 litre tank; 1x 5,000 tank) in bunded tank	<10,000 litres	Waste oil from CHP engines	Standard product used within industry
S5.4 A(1) (b) (i)	Propane Additive to biogas to ensure suitability of CV	12,000 litres (LPG)	40,000 m <sup>3</sup>	Flammable gas, explosive in confined spaces. Subject to DSEAR.	No viable alternative
S5.4 A(1) (b) (i)	Odorant Additive to biomethane for gas safety	50 ltr (used at rate of 12mg/m <sup>3</sup> )	100 kg	Flammable gas. Harmful to human health, irritant.	No viable alternative

## 4 Monitoring

4a Describe the measures you use for monitoring emissions by referring to each emission point in Table 2 above.

The air emission points A1; A2; A6; A7, A8; A9A-9C, to be monitored in accordance with the requirements of MCPD and Environment Agency guidance as laid out in the air emissions table presented earlier in this section.

Hours of operation of the flares, A6 and A8, to be monitored and logged. In the unlikely event that the total annual hours of operation exceed 10% of the hours in a year (836 hours), emissions from the flare would be subject to monitoring in accordance with EA guidance.

There is no routine monitoring proposed for points for biogas upgrading plant vents (A7), PRVs, vents and OCUs (A10-A27) other than recommended by the manufacturer to achieve effective operational conditions.

#### **4b Point source emissions to air only**

##### **4b1 Has the sampling location been designed to meet BS EN 15259 clause 6.2 and 6.3?**

No

##### **4b2 Are the sample ports large enough for monitoring equipment and positioned in accordance with section 6 and appendix A of BS EN 15259?**

No

##### **4b3 Is access adjacent to the ports large enough to provide sufficient working area, support and clearance for a sample team to work safely with their equipment throughout the duration of the test?**

Yes

##### **4b4 Are the sample location(s) at least 5 HD from the stack exit**

No

##### **4b5 Are the sample location(s) at least 2 HD upstream from any bend or obstruction?.**

No

##### **4b6 Are the sample location(s) at least 5 HD downstream from any bend or obstruction?**

No

##### **4b7 Does the sample plane have a constant cross sectional area?**

Yes

##### **4b8 If horizontal, is the duct square or rectangular (unless it is less than or equal to 0.35 m in diameter)**

No

##### **4b9 If you have answered 'No' to any of the questions 4b1 to 4b8 above, provide an assessment to how the standards in BS EN 15259 will be met.**

As an existing site with combustion assets, sampling locations and sampling ports may not meet all of the requirements for BS EN 15259, but monitoring has been carried out over a number of years in accordance with the permit requirements with the installed ports. Due to the nature of the ducting access, it is not possible to conduct a full velocity profile, however, no particulate sampling is required for biogas fuelled units, and all gaseous species are considered to be mixed sufficiently for the purposes of monitoring. There is no requirement to undertake a homogeneity test as per BS EN 15259 and as such the location cannot be compared against that or the criteria in M1. The sampling location is as previously approved for use by the Environment Agency.

Due to the size of the CHP and boilers, a permanent sampling platform is not provided, however, a temporary sampling platform is utilised to provide sufficient space, in accordance with standard industry practice.

## 5 Environmental impact assessment

### 5a Have your proposals been the subject of an environmental impact assessment under Council Directive 85/337/EEC of June 1985 [Environmental Impact Assessment] (EIA)?

No

## 6 Resource efficiency and climate change

### 6a Describe the basic measures for improving how energy efficient your activities are.

The installation is designed to treat thickened sewage sludge to enable its recycling to land as a fertiliser, and to capture and utilise biogas to upgrade biogas to biomethane and introduce it to the National Gas Grid and to generate green electricity.

The plant has been designed from first principles to be energy efficient. Gravity is used as far as practicable for the transfer of sludge and liquids within the installation in order to minimise energy requirements. Biogas is captured and used within the biogas upgrade plant in the first instance to upgrade biogas to biomethane to be exported from the site to the National Gas Grid. Biogas is also used within the CHP engines to generate both electricity for use within the wider site and for export to the electrical grid as appropriate. Waste heat from the CHP engine is utilised to ensure that the THP and primary digesters operate within the optimum temperature range for the anaerobic digestion process to be undertaken. The digester vessels are insulated to retain this additional heating. Flaring is minimised.

Lighting has been optimised for low energy use and all pumps and other mechanical and electrical plant subject to regular, routine, preventative maintenance to minimise losses.

### 6b Provide a breakdown of any changes to the energy your activities use up and create

The main site energy sources are electricity from the public supply and biogas generated by the anaerobic digester which is combusted in the CHP engine to generate electricity and heat on site. The change being applied for will not result in a change in the site's energy use as the indigenous sludge is already treated on site.

The main site energy source is electricity from the public supply. Natural gas from the public supply is combusted in the CHP engines to generate electricity and heat, and in the THP boilers to generate steam to the THP. The waste heat utilised from the CHP engines reduces the demand on natural gas in the boilers raising steam for the THP.

The biogas upgrade plant enables biomethane to be exported from the site to the National Gas Grid following appropriate clean-up and upgrading. In the event of the biogas upgrade plant not being available, biogas is instead combusted on site for electricity and heat generation, with excess electricity exported from the site to the national grid.

A number of further energy saving innovations are being incorporated into site operations as part of a "Net Zero" capital scheme.

### 6c Have you entered into, or will you enter into, a climate change levy agreement

No, the activities are not eligible to take part in the CCL Scheme.

### 6d Explain and justify the raw and other materials, other substances and water that you will use

See response to question 3c above. The change being applied for will not result in an increase in the site's raw materials use as the indigenous sludge is already treated on site.

**6e Describe how you avoid producing waste in line with Council Directive 2008/98/EC on waste**

The facility is a waste treatment plant, and the primary wastes produced through the processes on site are maintenance waste. Production of maintenance waste is minimised by ensuring that preventative maintenance is carried out based on a combination of manufacturers best practice and operational experience. Details of wastes are within the site Raw Materials, Water and Waste Management Plan, and reviewed at least every 4 years.

The additional processes at the site, for cellulose recovery and ammonia recovery should, over time and in the event that they are successful, will reduce the impact of the site by capturing waste materials for offsite recovery, helping to minimise the carbon footprint of the processes and works.

### 3.3 Form C4 – for waste import activities (see next section for C4 for cellulose recovery plant)

#### 1 What waste operations are you applying to vary?

##### Types of Waste accepted

See Table C3-1b in Section 3.3 above.

EWC codes as currently permitted.

#### 1c Deposit for recovery purposes

Are you applying for a waste recovery activity involving the permanent deposition of waste on land for construction or land reclamation (including landfill restoration)?

No

#### 2 Point source emissions to air, water and land

See Table C3-2 – Emissions

#### 3 Operating techniques

##### 3a Technical standards

Table C4-3a – Technical standards

Description of waste operation	Appropriate measure (TGN reference)	Document reference (if appropriate)
Other biological treatment of waste: deposit of imported non-hazardous waste for treatment through a wastewater treatment works.	Biological waste treatment: appropriate measures for permitted facilities	Updated 2nd February 2024

In all cases, describe the type of facility or operation you are applying for and provide site infrastructure plans, location plans and process flow diagrams or block diagrams to help describe the operations and processes undertaken.

##### 3b – General requirements

Table C4-3b General requirements

Name of the waste operation	Document references
If the technical guidance or your risk assessment shows that emissions of substances not controlled by emission limits are an important issue, send us your plan for managing them.	N/A – see Table C2-6 above
If the technical guidance or your risk assessment shows that odours are an important issue, send us your plan for managing them.	Odour Management Plan, Appendix F

Name of the waste operation	Document references
If the technical guidance or your risk assessment shows that noise or vibration are important issues, send us your noise or vibration plan (or both).	N/A – see Table C2-6 above

**3c Information for specific sectors**

N/A

**4 Monitoring**

**4a Describe the measures you use for monitoring emissions by referring to each emission point in Table 2 above**

See response for Form C3 previously

**4b Point source emissions to air only**

See response for Form C3 previously

### 3.4 Form C4 (For cellulose recovery plant)

#### 1 What waste operations are you applying for?

Table 1a

Name of the waste operation	Description of the waste operation	Annex I (D codes) and Annex II (R codes)	Hazardous waste treatment capacity	Non-hazardous waste treatment capacity
Strongford cellulose recovery plant	Recovery of cellulose from urban waste water	R3 - Recycling/reclamation of organic substances which are not used as solvents	N / A	3,420m <sup>3</sup> / hour (for bank of 10 CELLCAPs™) 3 – 4.5 tonnes recovered cellulose output per day.
Total Storage Capacity		No storage capacity in process <100 tonnes of cellulose output stored on site in covered skips at any time		
Annual Recovered Output		The full scale installation at Strongford will produce 4T/day of dried cellulose. The skips to store the cellulose will be collected daily by the carrier. Annually this would equate to 365 x 4 = 1460 T a year.		

## Types of Waste accepted

The EWC code for the waste is:

*19 12 12: other wastes (including mixtures of materials) from mechanical treatment of wastes*

This is a mirror non-hazardous waste code. UWWTD derived wastes are non-hazardous, including materials separated from them (in accordance with the WaSC IED permitting project), and we have added no further materials to this waste for its status to be changed.

### 1c Deposit for recovery purposes

**Are you applying for a waste recovery activity involving the permanent deposition of waste on land for construction or land reclamation (including landfill restoration)?**

No

### 2 Point source emissions to air, water and land

See air release table earlier in this application. Point A27 is associated with this plant.

There are no permitted emissions to water, sewer or land from the activities covered by this permit.

## 3 Operating techniques

### 3a Technical standards

**Table C4-3a – Technical standards**

Description of waste operation	Appropriate measure	Document reference (if appropriate)
Recovery of cellulose from urban waste water. 'R3 - Recycling/reclamation of organic substances which are not used as solvents'	Non-hazardous and inert waste: appropriate measures for permitted facilities	<a href="http://www.gov.uk">Non-hazardous and inert waste: appropriate measures for permitted facilities - Guidance - GOV.UK (www.gov.uk)</a> Updated 01/08/23

### 3b – General requirements

**Table C4-3b General requirements**

Name of the waste operation	Document references
If the technical guidance or your risk assessment shows that emissions of substances not controlled by emission limits are an important issue, send us your plan for managing them.	N/A
If the technical guidance or your risk assessment shows that odours are an important issue, send us your plan for managing them.	Odour Management Plan
If the technical guidance or your risk assessment shows that noise or vibration are important issues, send us your noise or vibration plan (or both).	N/A – see screening assessment

**If the TGN or H1 assessment shows that emissions of substances not controlled by emission limits are an important issue, send us your plan for managing them.**

Although screened out of the detailed Risk Assessment (Question C2 Q6), due to the nature of the process the facility has the potential to generate fugitive emissions to air and water, which are subject to a number of process controls.

Risk Matrix and Terminology for Accident for Risk Assessment

Likelihood	Consequence		
	Low	Medium	High
Low	Low	Low	Medium
Medium	Low	Medium	High
High	Medium	High	High

Classification	Likelihood	Consequence	Risk
<b>Low</b>	Probability of an event is low and likely only to occur in the long-term (a yearly basis or less frequent).	Impact is low or a minor, short-term nuisance. Minor release to a non-sensitive receptor or pollution of water course. Non-permanent health effects to human health (preventable by appropriate PPE). Minor surface damage to buildings; structures; services; or the environment which can be repaired immediately.	A level of harm is possible although this may not be noticeable to a receptor and would be a short-term event without lasting effects. Level of harm can be reduced using industry best practice and appropriate management techniques.
<b>Medium</b>	It is probable that an event will occur periodically in the medium-term (twice yearly basis).	Impact is noticeable in the short to medium-term. Large release impacting on the receiving media killing flora and fauna and requires remediation. Nuisance causing non-permanent health effects to human health. Damage to buildings; structures; services; or the environment preventing short-term use and/or requiring repair.	A level of harm may arise to a receptor which is noticeable although not long-lasting and may require some remedial actions in order to prevent re-occurrences.
<b>High</b>	An event is very likely to occur in the short-term (monthly or weekly basis) and is almost inevitable over the long-term OR there is evidence at the receptor of harm or pollution.	Impact is significant, wide-ranging and long-lasting effect. Has a chronic or acute impact on human health. Very large release that has a major impact on flora and fauna which may be very difficult to remediate. Significant damage to buildings; structures; services; or the environment which prevents use long-term and may require complete replacement. May cause a long-term impact or contribute towards a global issue due to releases of greenhouse gases.	A level of harm is likely to arise to a receptor that is severe causing significant harm to human health or the environment without appropriate remedial and mitigation measures being implemented. Remedial works to infrastructure and processes is required in the long-term.

Although screened out of the detailed Risk Assessment (Question B2 Q6), due to the nature of the material handled, the permitted operation has the potential to give rise to fugitive emissions.

**Table C4-3b(iii) – Fugitive emissions risk assessment**

Activity/Hazard	Normal or Abnormal	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
Emissions to air of odour	Normal	Emissions to air and dispersion leading to inhalation by local human and animal receptors	Medium	Low	Low	The drying of the cellulose occurs after the extracted cellulose has been extracted from the wastewater.	Low
Release of bioaerosols and dust	Normal	Emissions to air and dispersion leading to inhalation by local human and animal receptors. Odour impact of bioaerosols. Nuisance impact of dust.	Low	Low	Low	The risk of bioaerosol and dust is largely eliminated by only extracted cellulose in solid form, which has been pressed into solid cake and stored within enclosed skips or trailers. Roads are made from concrete/asphalt and not prone to the generation of dust.	Low
Spillage of liquids, including chemicals and oils.	Abnormal	Emissions to surface waters close to and downstream of site. Acute effect resulting in loss of flora and fauna. Chronic effect resulting in deterioration of water quality. Emissions to ground and ground water.	Low	Medium	Low	Chemicals, principally soap, are all stored within suitably bunded tanks and IBCs with rainwater removed as required to maintain 110% capacities. Handling and use of chemicals is carried out by trained personnel. COSHH data sheets available. Spill kits available on site. There are no point source emissions to water within the permit boundary, as the drainage system pumping back to works inlet.	Low
Generation of solid waste resulting in litter	Normal	Releases of litter to the environment. Visual nuisance and local loss of amenity	Low	Low	Low	Site operations do not give rise to large amounts of solid wastes and litter that would be prone to dispersion by wind. Waste is stored securely for collection by appropriately licensed approved contractors. Litter picking activities are completed as required.	Low

**Where the TGN or H1 assessment shows that odours are an important issue, send us your odour management plan.**

Due to the nature of the process, the facility has the potential to generate odorous emissions resulting from the permitted activities. Odour management is a key operational objective, as summarised in the risk assessment table below. A copy of the site-specific odour management plan has been appended to this application.

**Table C4-3b(iv) – Odour risk assessment**

Activity/Hazard	Normal or Abnormal	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
Storage of site generated wastes	Normal	Emissions to air and dispersion leading to inhalation by local human receptors Loss of amenity from odour nuisance	Low	Low	Low	Wastes generated on site are not inherently odorous due to being dried prior to being stored securely for collection by appropriately licensed approved contractors.	Low

**If the TGN or H1 assessment shows that noise or vibration are important issues, send us your noise or vibration management plan (or both)**

The facility has the potential to generate noise as a result of the permitted activities. Potentially noisy activities are subject to a number of process controls and noise management is a key operational objective, as summarised in the risk assessment table below. The EA Noise Advisory Tool has been undertaken, the results of this showed that no noise impact assessment or noise management plan was required.

**Table C4-3b(v) - Noise Risk Assessment**

Activity/Hazard	Normal or Abnormal	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
Operation of site vehicles	Normal	Generation of noise with air transportation, causing loss of amenity to local human receptors. Generation of vibration with ground transmission, causing loss of amenity to local human receptors.	Medium	Medium	Medium	Vehicle movements across the site subject to speed limit and traffic management plan to reduce generation of noise. Reversing obligations minimised by site layout. Cellulose removal from site limited to daytime only.	Low

**Table C4-3b(vi) – Environmental Risk Assessment and Accident Management Plan**

Activity/Hazard	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
Major fire and/or explosion causing the release of polluting materials to air, water or land.	Emissions to air and dispersion leading to inhalation by local human receptors. Respiratory irritation, illness and nuisance to local population Emissions to ground and ground water of urban waste water contaminating soil and/or groundwater. Run-off from site polluting surface water courses. Harm to aquatic flora and fauna and chronic effect on water quality. Injury to staff, fire fighters or arsonists/vandals.	Low	High	Medium	Follow site Incident Response Plan and inform relevant authorities. Management systems requires DSEAR assessment which is adhered to by site operations. All visitors subject to site inductions and accompanied. Permit-to-work system in place. Preventative maintenance programme and maintenance plans are in place in order to maintain equipment effectively. Smoking only permitted in designated areas of site.	Low
Minor fire causing the release of polluting materials to air, water or land	Emissions to air and dispersion leading to inhalation by local human receptors. Respiratory irritation, illness and nuisance to local population Emissions to ground and ground water of urban waste water contaminating soil and/or groundwater. Run-off from site polluting surface water courses. Harm to aquatic flora and fauna and chronic effect on water quality. Injury to staff, fire fighters or arsonists/vandals.	Low	Medium	Low	Follow site Incident Response Plan and inform relevant authorities. Management systems requires DSEAR assessment which is adhered to by site operations. All visitors subject to site inductions and accompanied. Permit-to-work system in place. Preventative maintenance programme and maintenance plans are in place in order to maintain equipment effectively. Smoking only permitted in designated areas of site.	Low
Failure to contain firefighting water	Emissions to ground and ground water of contaminated	Low	Medium	Low	Likelihood of firefighting water being generated is low as the risk of fire is low.	Low

Activity/Hazard	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
	firefighting water entering soil and/or groundwater. Run-off from site to surface water courses. Harm to aquatic flora and fauna. Chronic effect on water quality				Follow site Incident Response Plan and inform relevant authorities. Spill kits provided around the site can be used to direct run-off towards site drainage. Site drainage returns to works inlet providing containment and treatment process for fire water. Arrange for off-site tankering of firefighting water, if required.	
Spillage of raw materials during (e.g. diesel, polymer) during use, transfer and disposal operations.	Emissions to ground and ground water of materials entering soil and/or groundwater. Run-off of liquids from site to surface water courses. Harm to aquatic flora and fauna. Chronic effect on water quality	Low	Medium	Low	Raw materials are stored on made ground, within bunded containers or on bunds to contain spillages of 110% of the volume. Contents of bunds are regularly checked during environmental audits and after periods of heavy rainfall and emptied as required. In event of a spillage, follow site spillage response plan and inform relevant site personnel. COSHH data sheets available. Deliveries to site are made by approved suppliers. Use of raw materials is carried out by trained personnel or automatically controlled processes. Penstock valves available within chemical delivery areas to contain large spillages. In the event of a minor spillage, spill kits are provided around the site which can be used to contain a spillage and direct it towards site drainage if suitable. Site drainage returns to works inlet providing treatment process for suitable materials, or arrange off-site tankering of waste, if required.	Low

Activity/Hazard	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
Spillage of urban waste water or cellulose during processing and transfer operations e.g. tank overtopping, pipework leaks	Emissions to ground and ground water of materials entering soil and/or groundwater. Run-off of liquids from site to surface water courses. Harm to aquatic flora and fauna. Chronic effect on water quality	Low	Low	Low	Processing and transfer operations of waste materials is largely an automatic process controlled by the Process Controllers and parameters set within the SCADA system. CELLCAP units are fitted with sensors to monitor levels within a tank and can inhibit additional pumping if high alarms activate. Preventative maintenance programme and maintenance plans are in place in order to maintain equipment effectively and minimise the risk of spillages. In event of a spillage, follow site spillage response plan and inform relevant site personnel and relevant authorities. Spill kits are provided around the site which can be used to contain a spillage and direct it towards site drainage. Site drainage returns to works inlet providing treatment process for sludge or arrange off-site tankering of waste to another site. Sludge is relatively viscous and not highly mobile.	Low
All on-site hazards: machinery	Direct physical contact with human population and /or livestock after gaining unauthorised access to the facility. Bodily injury	Low	High	Medium	Direct physical contact is minimised by activity being carried out by enclosed plant and equipment, which has undergone a HAZOP assessment. Site activities are managed and operated in accordance with a management system. Site physical security measures to prevent unauthorised access.	Low

Activity/Hazard	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
					Assets are protected by various physical means including fencing, kerbing and bollards to prevent vehicle strikes. Site has a one-way traffic management system to minimise the need to reverse. Use of banksmen as appropriate. Vehicles equipped with reversing alarms.	
Vandalism causing the release of polluting materials to air (smoke or fumes), water or land.	Emissions to air and dispersion leading to inhalation by local human receptors. Respiratory irritation, illness and nuisance to local population Emissions to ground and ground water of digestate contaminating soil and/or groundwater. Run-off from site polluting surface water courses. Harm to aquatic flora and fauna and chronic effect on water quality. Injury to staff, fire fighters or arsonists/vandals.	Low	High	Medium	Unauthorised access is unlikely to happen and minimised by physical site security measures and effective management systems. Site has access controlled gated entry for all vehicular access. Fence runs the perimeter of the site. Additional security fences around some assets and other assets are kept within locked containers or buildings. Warning signs are displayed.	Low
Flooding from rivers, streams and groundwater	Emissions to surface water course and harm to aquatic flora and fauna. Infiltration to ground and groundwater. Harm to aquatic flora and fauna and chronic effect on water quality.	Low	Low	Low	The site is located within a Flood Risk Zone 3 as outlined on the Environment Agency's Flood Map for Planning and therefore is not situated in an area prone to flooding. General wider works designed to minimise risk of localised works flooding due to storm surges. Follow site Incident Response Plan and inform relevant authorities.	Low

Activity/Hazard	Environmental Impact (Pathway-Receptor)	Likelihood	Consequence	Risk	Risk Management	Residual Risk
					Take appropriate corrective and preventative actions to minimise environmental impact	
Flooding due to drain blockages and/or excessive rainfall causing localised on- site surface water flooding	Emissions to surface water course and harm to aquatic flora and fauna. Infiltration to ground and groundwater. Harm to aquatic flora and fauna and chronic effect on water quality.	Medium	Low	Low	Site wide drainage system linked to main sewage works, which includes additional capacity in storm tanks within the works to manage additional flows. Follow site Incident Response Plan and inform relevant authorities. Take appropriate corrective and preventative actions to minimise environmental impact	Low
Loss of mains power leading to failure of pumps / control systems and possible leaks and escape of sludge.	Emissions to ground and ground water of materials entering soil and/or groundwater. Run-off of liquids from site to surface water courses. Harm to aquatic flora and fauna.	Low	Medium	Low	Site CHP engines (separately permitted) are able to supply electricity to the site using biogas supplies on site. Failsafe systems in place to ensure urban waste water process can continue in the event of a loss of power and that systems are promptly returned into operation. Site wide drainage system linked to main sewage works in the event of a spillage.	Low

**3c Information for specific sectors**

N/A

**4 Monitoring**

**4a Describe the measures you use for monitoring emissions by referring to each emission point in Table 2 above**

There are no emission points to water, land or sewer from the facility.

**4b Point source emissions to air only**

There is a single exhaust vent on the hygienator unit. The purpose of this vent is to allow waste heat to escape and no monitoring is proposed of this point.

### 3.5 Form C6 questions

The relevant questions within the form are those applicable to effluent and / or surface water run-off arising from the operation of an installation.

#### Q1 About the effluent – details and type, continued

**1a Give a brief description of the effluent discharge you want a permit for, for example, treated domestic sewage effluent.**

From Point T1 – release via the site drainage system

This effluent is a mixture of waste liquors from the operation of the installation for the anaerobic treatment of separated sewage sludge. It primarily comprises of thickening and dewatering liquors returned to the work inlet following the dewatering of treated sewage sludge, along with surface water run off from operational areas, boiler blowdown, biogas condensate and cleaning residues. Some of these liquors are treated within the LTP prior to being returned to the works inlet.

Point T2 – release via the site drainage system

This is the point where tanker imports for the inlet leave the permit boundary to transfer to the works inlet.

Point T3 – returns from cellulose recovery plant to main flow

This is the point that the returns from the cellulose recovery plan return to the main UWWTD flow at the works. These returns have not been chemically altered from the incoming UWWTD flow, being subject only to physical treatment through filtration.

**1b Give this effluent a unique name.**

T1 - Liquor returns 1.

T2 – Tanker imports.

T3 – Cellulose plant returns.

**1d Have you obtained all the necessary permissions in addition to this environmental permit to be able to carry out the discharge (see B6 guidance notes for more details)?**

Yes. The discharge is into the inlet of a sewage works controlled by the applicant.

**Q2 About the effluent – how long will you need to discharge the effluent for?**

**2c Will the discharge take place all year?**

Yes, the discharge will take place all year

**Q3 How much do you want to discharge?**

**3b What is the maximum volume of effluent you will discharge in a day?**

1,360 cubic metres

**3c What is the maximum rate of discharge?**

15.7 litres / second

**3d What is the maximum volume of non - rainfall dependent effluent you will discharge in a day?**

1,360 cubic metres

**4 No questions**

**5 Should your discharge be made to the foul sewer?**

**5a How far away is the nearest foul sewer from the boundary of the premises?**

Not applicable, the site is located within the curtilage of a sewage treatment works and discharges into the works inlet via the site drainage system.

**5b2 Discharges from all other premises including trade effluent**

Not applicable, the site is located within the curtilage of a sewage treatment works and discharges into the works inlet via the site drainage system.

**6 Nutrient neutral**

**6a Are you in a nutrient neutral catchment?**

No

**7 How will the effluent be treated?**

**7a Do you treat your effluent?**

Some waste waters generated within the installation are subject to pre-treatment via the LTP.

Following treatment, the combined effluent generated by the process of treating sewage and sewage related arisings within the installation is returned to the inlet of the wider sewage treatment works, where it is subject to aerobic treatment in a mixture with UWWTD related waste waters.

**7b Fill in Table 2 for each stage of the treatments carried out on your effluent in the order in which they are carried out**

**Table C6-6b – (Table 2) Treatments carried out on your effluent**

Order of Treatment	Code Number	Description
First	09	Primary settlement within sewage works
Second	31	Activated sludge process
Third	03	Tertiary biological treatment

**7g You must provide details on an extra sheet of the final effluent discharge quality that the overall treatment system is designed to achieve.**

As permitted by permit T/01/36052/R.

Emission limits are:

12mg/l BOD;

30mg/l Suspended Solids;

3 mg/l ammonia; and  
1mg/l phosphorus

**8 What will be in the effluent?**

**8b Are any of the specific substances, as defined in the above guidance, added to or present in the effluent as a result of the activities on site??**

No specific substances have been added to the effluent based on a review of the chemical safety data sheets for the chemicals used within the processes on site.

However, there is a likelihood that specified substances are present within the effluents handled, which include both tanker trade imports to the inlet and UWWTD materials delivered by sewer, which may include specified substances from households, trade effluent discharges into the sewerage network, road and hard standing runoff and unconsented releases from commercial and industrial premises.

At present, Severn Trent are starting to collect effluent data from works in order to undertake appropriate H1 screening and modelling, if necessary, based upon the outcome of the H1 screening tool. There is currently a backlog in receiving data from UKAS accredited commercial laboratories and therefore, no site currently has a full 12months of data available. In addition, some processes on site at Strongford are not currently in operation within the UK and therefore, detailed effluent analysis is not available even from a proxy site, as plants within mainland Europe will handle a different effluent composition.

Indicative H1 modelling has been undertaken on limited proxy data from similar Severn Trent sites as far as possible, i.e. data is from a site equipped with a THP rather than conventional anaerobic digestion.

**8c Have any of the specific substances, as defined in the above guidance, been detected in samples of effluent?**

Please see previous answer and data presented in the H1 excel spreadsheet.

**8d If you have answered 'No' to any of questions 8a to 8c provide details of the evidence you have submitted, include data of all substances assessed, whether or not they require to be taken forward to question 9.**

Please note that if you discharge directly into a designated conservation site, we will consult with Natural England which may result in the requirement for further modelling which you may be required to carry out.

Full data to be supplied as part of the industry standard IC.

**8e What is the maximum temperature of your discharge?**

20°C back into the sewage works

**8f What is the maximum expected temperature change of the incoming water supply?**

0°C

**9 Environmental risk assessments and modelling**

**9e Discharges to freshwater (non-tidal) rivers from an installation, including discharges via sewer**

No modelling has been undertaken on the output from the installation at present, due to a lack of quality data over the required 12 month period and confirmation of flows. The final effluent discharge from the wider works, which includes the installation arisings has previously been subjected to modelling as part of the environmental permitting discharge application process.

**8f Environmental impact assessment**

No environmental impact assessment has been carried out on the installation, as it is an existing facility.

**10 Monitoring arrangements**

**10a What is the national grid reference of the inlet sampling point? (for example, SJ 12345 67890)**

Not applicable to this installation

**10b What is the national grid reference of the effluent sample point?**

Current sampling occurs at the final effluent point: SJ 87820 39050

**10d What is the national grid reference of the flow monitoring point?**

No flow meter installed

**10e Does the flow monitor have an MCERTS certificate?**

No. No flow meter installed

**10f Do you have a UV disinfection efficacy monitoring point?**

No. Not installed as part of this installation.

**10j You should clearly mark on the plan the locations of any of the above that apply to this effluent.**

Please see site emission point plan.

**10k Do you intend to do your own effluent monitoring?**

Yes

**11 Where will the effluent discharge to?**

**11a Where the effluent discharges to**

Non-tidal river, stream or canal

**11b Is this effluent discharged through more than one outlet?**

No

**Section 2 – Discharges to non-tidal river, stream or canal**

**S2.1 Give the discharge point a unique name**

Final Effluent Outlet

**S2.2 Give the national grid reference of the discharge point**

SJ 87820 39050

**S2.3 Give the name of the watercourse, canal or the main watercourse if it is a tributary**

River Trent

**S2.4 Is the discharge into a:**

Non-tidal river

**S2.5 Does the discharge reach the watercourse or canal by flowing through a surface water sewer?**

No

**S2.6 Does the discharge reach the final surface watercourse or canal by flowing through highway drains?**

No

**S2.7 Does the watercourse dry up for part of the year?**

No

**S2.8 If the watercourse does dry up for part of the year, how many metres downstream of the discharge is it before the discharged effluent soaks into the ground?**

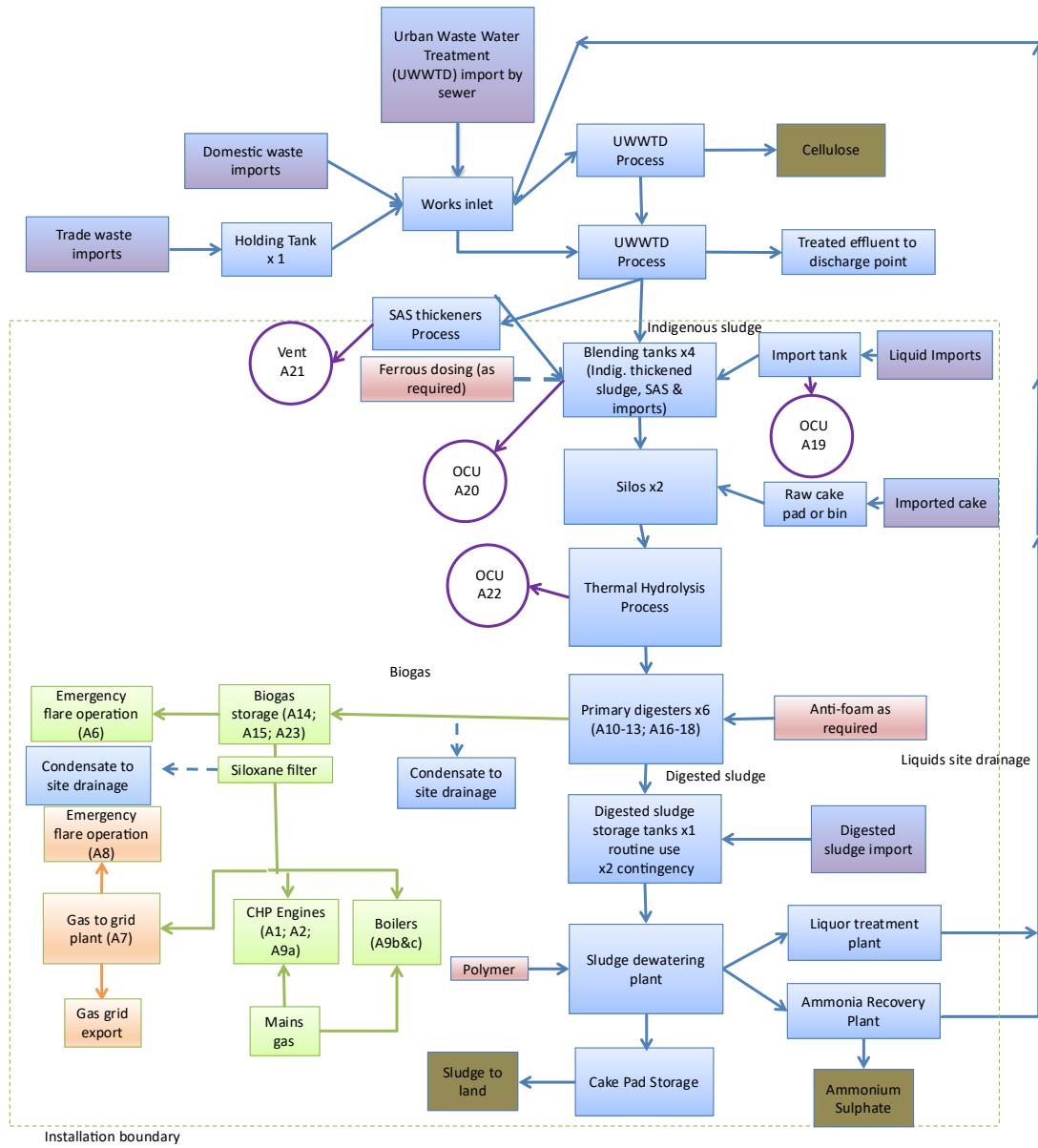
N / A

## **Appendix A. Figures**

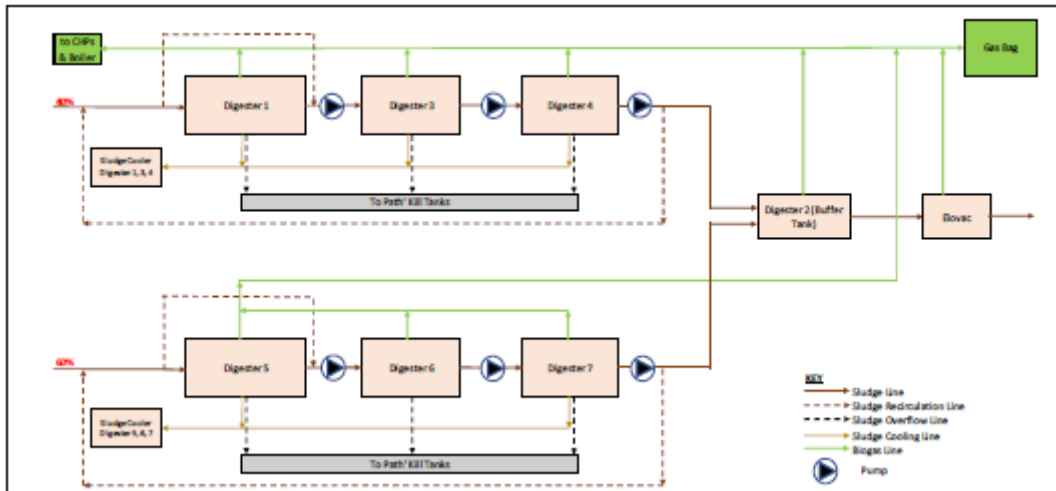
**A.1.1 Site boundary**

**A.1.2 Site emission point plan**

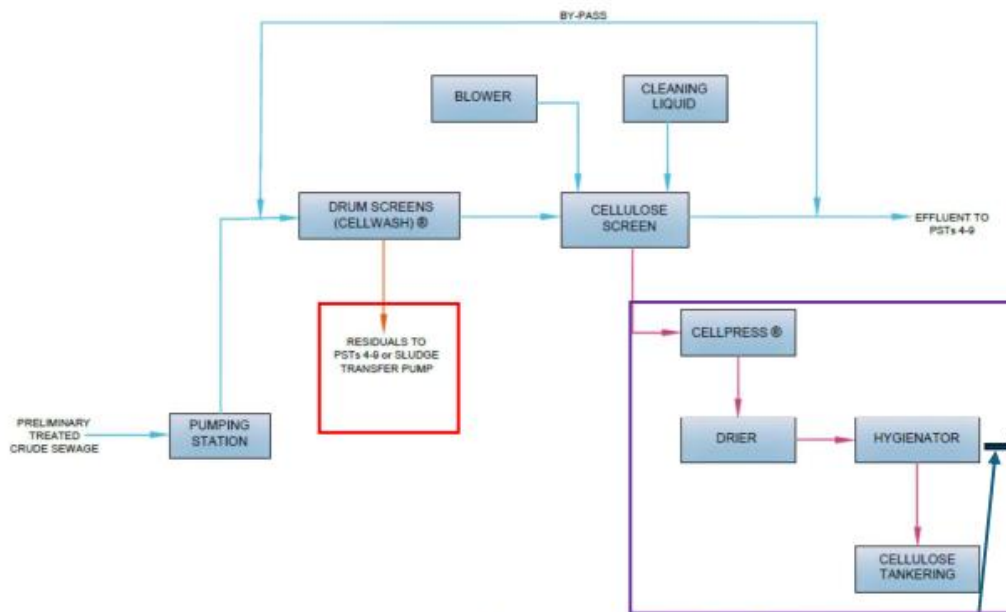
A.1.3 Process Flow Diagram



= waste imports      = gas routes  
 = sludge routes



Detailed digester diagram, with repurposed Digester 2 and ELOVAC



Effluent discharge from the Cellpress and air emission point from the dryer/hygenator at some point

## **Appendix B. Certificates**

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## Appendix C. H5 Site condition report

# SITE CONDITION REPORT TEMPLATE

For full details, see H5 *SCR guide for applicants* v2.0 4 August 2008

**COMPLETE SECTIONS 1-3 AND SUBMIT WITH APPLICATION**

**DURING THE LIFE OF THE PERMIT: MAINTAIN SECTIONS 4-7**

**AT SURRENDER: ADD NEW DOC REFERENCE IN 1.0; COMPLETE SECTIONS 8-10; & SUBMIT WITH YOUR SURRENDER APPLICATION.**

<b>1.0 SITE DETAILS</b>	
Name of the applicant	Severn Trent Water
Activity address	Strongford Sewage Treatment Works Barlaston Old Road, Barlaston, Stoke-on-Trent, ST12 9EX.
National grid reference	(NGR) SJ 87815 39191
Document reference and dates for Site Condition Report at permit application and surrender	Original permit issued Sept 1996; and varied several times since
Document references for site plans (including location and boundaries)	See figure 1 in permit

**Note:**

In Part A of the application form you must give us details of the site's location and provide us with a site plan. We need a detailed site plan (or plans) showing:

- Site location, the area covered by the site condition report, and the location and nature of the activities and/or waste facilities on the site.
- Locations of receptors, sources of emissions/releases, and monitoring points.
- Site drainage.
- Site surfacing.

If this information is not shown on the site plan required by Part A of the application form then you should submit the additional plan or plans with this site condition report.

<b>2.0 Condition of the land at permit issue</b>	
Environmental setting including: <ul style="list-style-type: none"> <li>• geology</li> <li>• hydrogeology</li> <li>• surface waters</li> </ul>	The site is located principally within Flood Risk Zones 3 although parts of the north western corner of the site including the cake pad sit within flood risk zones 1 & 2. This indicates a low risk of flooding for most of the site, although some areas are between 1:100 and 1:1000 annual risk of flooding. The site sits outside any SPZ, and on a Secondary A aquifer superficial deposit BGS designation, and Secondary A aquifer for BGS bedrock designation. The River Trent runs to the west of the site, travelling north-south
Pollution history including:	Historic maps show that prior to 1884 the site was agricultural fields bounded to the east by a road (the Old Road) and then the Trent & Merseyside Canal, and to the

<ul style="list-style-type: none"> <li>• pollution incidents that may have affected land</li> <li>• historical land-uses and associated contaminants</li> <li>• any visual/olfactory evidence of existing contamination</li> <li>• evidence of damage to pollution prevention measures</li> </ul>	<p>west by the River Trent and Stone Road (A34). All other surrounding land is agricultural or woodland, although the stream along the southern boundary can be seen.</p> <p>By 1922, the field layout appears to be the unchanged, however, the north west quadrant of where the works are, now includes two sewage filter beds, but the rest of the site is undeveloped. These beds are unlabelled but expanded by 1938. The works is expanded and</p> <p>By 1955, sewage treatment works infrastructure appears at the site, with the works occupying almost its current footprint. The tanks and infrastructure present at this point have changed internal layout on a number of occasions, but remaining as a sewage treatment works for the entire duration</p>
<p>Evidence of historic contamination, for example, historical site investigation, assessment, remediation and verification reports (where available)</p>	<p>No known intrusive SI has been undertaken at the site, however, the site will have elevated levels of metals and pathogens due to its use as a sewage works</p>
<p>Baseline soil and groundwater reference data</p>	<p>None available – the applicant is aware that this is at their risk, but have no plans to close and decommission the site within the foreseeable future</p>
<p><b>Supporting information</b></p>	<p>None provided</p>

<h3>3.0 Permitted activities</h3>	
<p>Permitted activities</p>	<p>Treatment of wastes and sewage within an anaerobic digestion process, including dewatering and storage of cake. Storage and utilisation of biogas either through combustion on site or clean up and injection into the national gas grid.</p> <p>Treatment of dewatering liquors by aerobic treatment prior to return to the works inlet</p>
<p>Non-permitted activities undertaken</p>	<p>Operation of aerobic treatment of urban waste water</p>
<p>Document references for:</p> <ul style="list-style-type: none"> <li>• plan showing activity layout; and</li> <li>• environmental risk assessment.</li> </ul>	<p>See permit emission point plan</p>

**Note:**

In Part B of the application form you must tell us about the activities that you will undertake at the site. You must also give us an environmental risk assessment. This risk assessment must be based on our guidance (*Environmental Risk Assessment - EPR H1*) or use an equivalent approach.

It is essential that you identify in your environmental risk assessment all the substances used and produced that could pollute the soil or groundwater if there were an accident, or if measures to protect land fail.

These include substances that would be classified as 'dangerous' under the Control of Major Accident Hazards (COMAH) regulations and also raw materials, fuels, intermediates, products, wastes and effluents.

If your submitted environmental risk assessment does not adequately address the risks to soil and groundwater we may need to request further information from you or even refuse your permit application.

<b>4.0 Changes to the activity</b>	
<b>Have there been any changes to the activity boundary?</b>	No
<b>Have there been any changes to the permitted activities?</b>	<p>Yes redefinition of site to non-hazardous treatment plant.</p> <p>Addition of listed activity for aerobic liquor treatment plant within the existing permit boundary</p> <p>Addition of listed activity for chemical scrubber based ammonia recovery plant within existing permit boundary</p> <p>Addition of new waste management activity for the recovery of cellulose from UWWTD stream at site</p>
<b>Have any 'dangerous substances' not identified in the Application Site Condition Report been used or produced as a result of the permitted activities?</b>	<p>No new 'dangerous substances' as defined have been included due to the changes.</p> <p>However, new chemicals which pose physical danger to the site infrastructure, namely bulk sulphuric acid storage has been undertaken. The storage tank is bunded and the surfaces close to the tank suitable coated in protective acid resistant paint to minimise the risk from any leaks or drips during filling activities.</p> <p>New ammonium sulphate product tank installed which is suitably bunded.</p>
<b>Checklist of supporting information</b>	See permit application supporting documents for full details

<b>5.0 Measures taken to protect land</b>	
Use records that you collected during the life of the permit to summarise whether pollution prevention measures worked. If you can't, you need to collect land and/or groundwater data to assess whether the land has deteriorated.	
<b>Checklist of supporting information</b>	<ul style="list-style-type: none"> <li>• Inspection records and summary of findings of inspections for all pollution prevention measures</li> <li>• Records of maintenance, repair and replacement of pollution prevention measures</li> </ul>

**6.0 Pollution incidents that may have had an impact on land, and their remediation**

Summarise any pollution incidents that may have damaged the land. Describe how you investigated and remedied each one. If you can't, you need to collect land and /or groundwater reference data to assess whether the land has deteriorated while you've been there.

<b>Checklist of supporting information</b>	<ul style="list-style-type: none"> <li>Records of pollution incidents that may have impacted on land</li> <li>Records of their investigation and remediation</li> </ul>
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### 7.0 Soil gas and water quality monitoring (where undertaken)

Provide details of any soil gas and/or water monitoring you did. Include a summary of the findings. Say whether it shows that the land deteriorated as a result of the permitted activities. If it did, outline how you investigated and remedied this.

<b>Checklist of supporting information</b>	<ul style="list-style-type: none"> <li><b>Description of soil gas and/or water monitoring undertaken</b></li> <li><b>Monitoring results (including graphs)</b></li> </ul>
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### 8.0 Decommissioning and removal of pollution risk

Describe how the site was decommissioned. Demonstrate that all sources of pollution risk have been removed. Describe whether the decommissioning had any impact on the land. Outline how you investigated and remedied this.

<b>Checklist of supporting information</b>	<ul style="list-style-type: none"> <li><b>Site closure plan</b></li> <li><b>List of potential sources of pollution risk</b></li> <li><b>Investigation and remediation reports (where relevant)</b></li> </ul>
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### 9.0 Reference data and remediation (where relevant)

Say whether you had to collect land and/or groundwater data. Or say that you didn't need to because the information from sections 3, 4, 5 and 6 of the Surrender Site Condition Report shows that the land has not deteriorated.

If you did collect land and/or groundwater reference data, summarise what this entailed, and what your data found. Say whether the data shows that the condition of the land has deteriorated, or whether the land at the site is in a "satisfactory state". If it isn't, summarise what you did to remedy this. Confirm that the land is now in a "satisfactory state" at surrender.

<b>Checklist of supporting information</b>	<ul style="list-style-type: none"> <li>Land and/or groundwater data collected at application (if collected)</li> <li>Land and/or groundwater data collected at surrender (where needed)</li> <li>Assessment of satisfactory state</li> <li>Remediation and verification reports (where undertaken)</li> </ul>
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### 10.0 Statement of site condition

Using the information from sections 3 to 7, give a statement about the condition of the land at the site. This should confirm that:

- the permitted activities have stopped
- decommissioning is complete, and the pollution risk has been removed
- the land is in a satisfactory condition.

## **Appendix D. BAT Assessment**

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## Appendix E. CIRIA 736

## **Appendix F. Odour Management Plan**

## **Appendix G. Air Quality Memo**

## **Appendix H. H1 Assessment**

## **Appendix I. Noise Screening Assessment**